

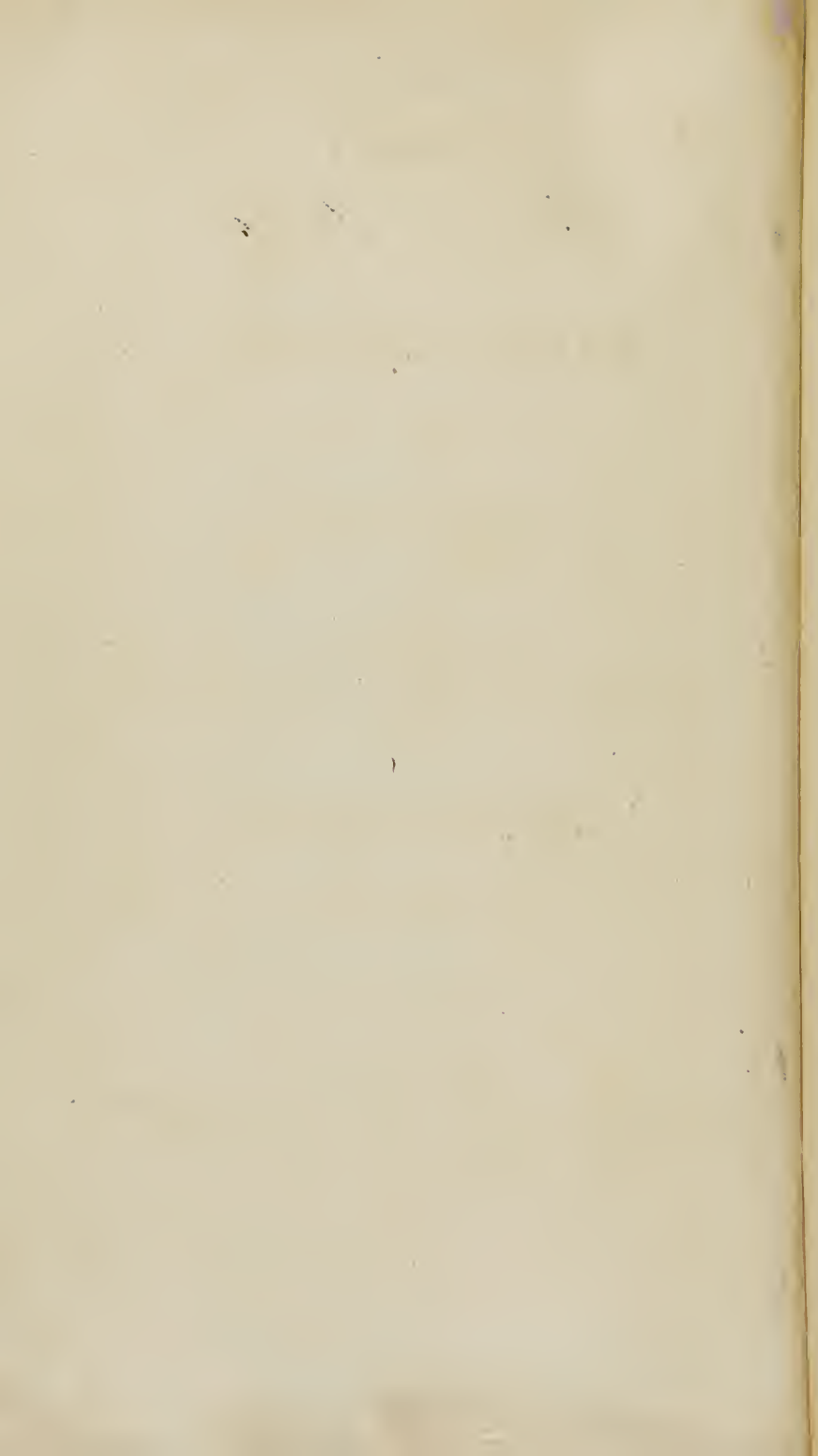
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MATERIA MEDICA

AND

PHARMACY.

BY J. MURRAY,

LECTURER ON CHEMISTRY, AND ON MATERIA MEDICA AND
PHARMACY.

TWO VOLUMES IN ONE.

VOL. I.

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TO
JAMES HOME, M. D.
PROFESSOR OF MATERIA MEDICA
IN THE
UNIVERSITY OF EDINBURGH,
THIS WORK IS INSCRIBED,
WITH
SENTIMENTS OF THE HIGHEST RESPECT,
BY
THE AUTHOR.

JAMES JOHNSON, JR.

PROFESSOR OF MATHEMATICS

1888

UNIVERSITY OF CHICAGO

1888

1888

UNIVERSITY OF CHICAGO

1888

THE CHICAGO

PREFACE.

IN composing the following work, the object which I principally had in view was to render more useful the lectures I deliver, on the subjects of which it treats. I could not doubt of the advantages to be derived from an outline which presents to the student the general arrangement of the course, and a summary of the leading facts and principles which it is designed to illustrate. And I deemed this the more necessary, as the classification of the *Materia Medica*, which I have adopted, and some of the views of the operations of medicines, are different from those which have hitherto been proposed.

I was still farther induced to engage in a task of this kind, from there being no work on *Materia Medica* or Pharmacy, to which I could refer, as adapted to convey just ideas on these branches of medicine in their present state. With the exception of the new and valuable edition of the *Edinburgh Dispensatory*, by Dr. DUNCAN *júnior*, (published since the greater part of this treatise was written), there is no elementary work on Pharmacy, in which the discoveries of modern chemistry are introduced: and former systems of *Materia Medica*, whatever may have been their merits, have in some measure become obsolete and deficient, in consequence of the changes that have taken place, within these twenty years, in the theory and practice of medicine, and in the sciences with which it is connected.

The same reasons suggested the propriety of extending the plan of the work farther than that merely of a Syllabus or Text-Book. I have accordingly adopted one more comprehensive, and have endeavoured to present such a view of the principles

and facts of *Materia Medica* and Pharmacy, as may be useful, independent of the lectures to which it is related.

The first part of this Synopsis is allotted to the General Principles of PHARMACEUTIC CHEMISTRY. For this I might perhaps have referred to the *Elements of Chemistry*, which I formerly published. It seemed preferable, however, to render the present treatise complete in itself, so far as the plan extended; and by prefixing such a summary, an opportunity was afforded of conveying some general observations, more immediately connected with Pharmacy.

MATERIA MEDICA forms the second division of the work. In this, I have adopted that arrangement which, after mature deliberation, appears to me preferable to any other,—that of classing the different substances according to their medicinal powers. I have endeavoured to establish a comprehensive classification of this kind, and, under each class, to explain the general operation and practical applications of the substances belonging to it. The plan followed with regard to each article, is, to give its natural history, describe its sensible properties, its chemical analysis and pharmaceutic treatment, and enumerate its uses in the treatment of diseases, with its dose, modes of administration, and officinal preparations. In the selection of the articles, I have been careful to exclude such as have been discarded from modern practice, and which an undue regard to antiquity has too long retained in publications on *Materia Medica*.

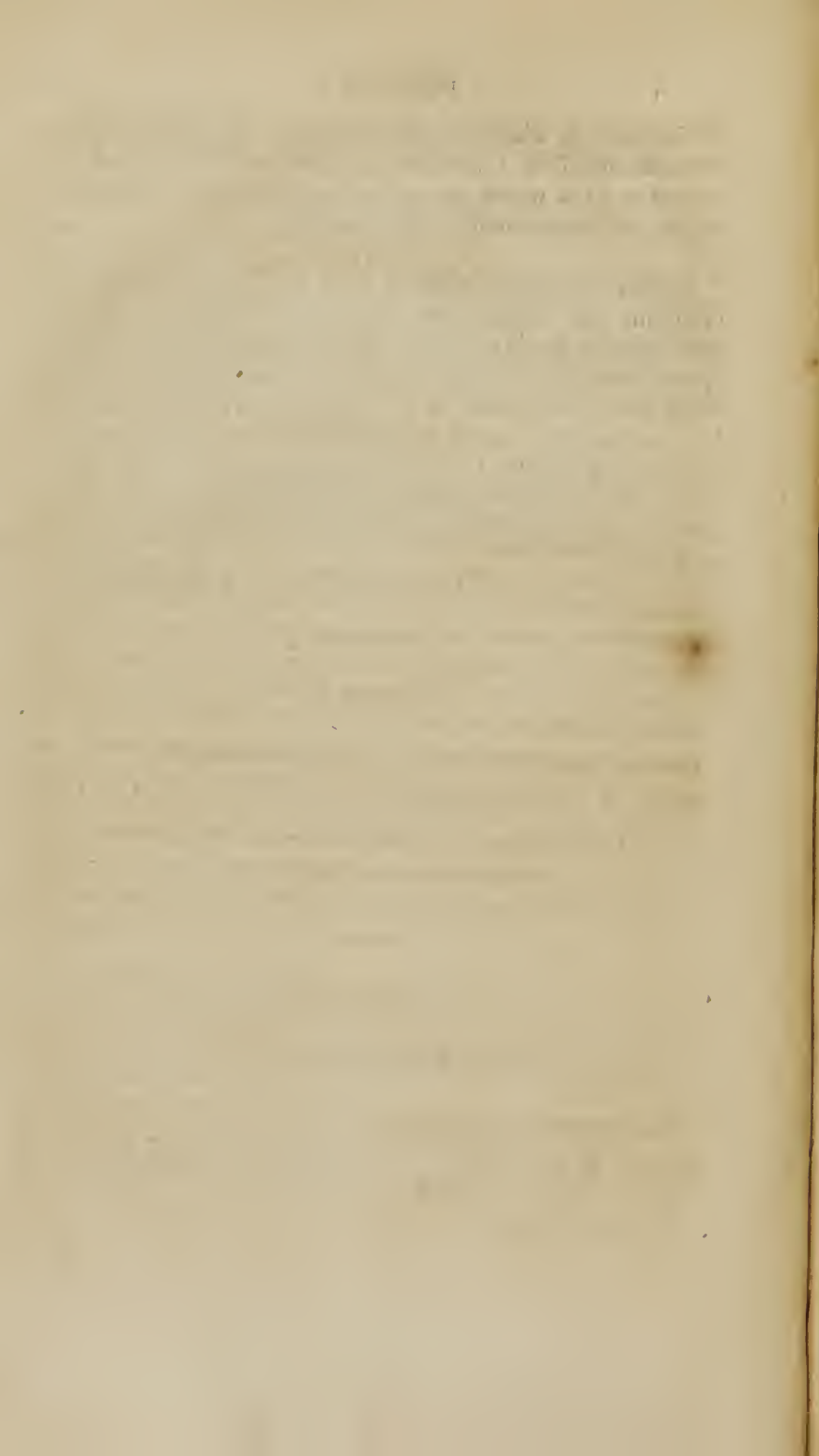
The third part is devoted to PHARMACY. The *Pharmacopæia* of the *Edinburgh College* affording a selection of Pharmaceutical Preparations, superior, perhaps, to any other, and using likewise the established language of chemistry and natural history, has been adopted as the basis of this part of the work. To a translation of its processes, I have added, under each preparation, its medicinal uses and dose, with the theory

of the process, where this was requisite. The corresponding preparations of the *London Pharmacopœia* are likewise noticed, as well as a few which, though not inserted in either Pharmacopœia, are occasionally used in practice.

As there are some peculiarities with regard to the modes of preparing and administering the Gases, I have not placed those of them which may be medicinally employed, under their appropriate classes in the *Materia Medica*, but have thrown them into an Appendix, to which also, for a similar reason, I have referred the consideration of Electricity and Galvanism as medicinal agents. Lastly, as connected with the subjects of these volumes, I have subjoined the heads of a lecture which I have been accustomed to deliver on Extemporaneous Prescriptions.

J. MURRAY.

EDINBURGH,
January 20, 1804.



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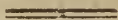
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INTRODUCTION.

MATERIA MEDICA, understood according to the strict definition of the term, is that department of the Science of Medicine which relates to the knowledge of remedies, or of the effects produced in the human system by such substances as are employed for the removal of disease. The **OBJECTS** to be attended to in its study are the Natural History, the Chemical Composition and Properties, and the Medicinal Powers and Applications of the Substances which belong to it.

The **NATURAL HISTORY** of these substances is of utility in furnishing appropriate characters by which they may be distinguished. Many of them bear a close resemblance to each other, and can only be discriminated by those minute and accurate distinctions which the methods of natural history afford.

From the intimate connexion which frequently subsists between those properties on which natural classification is established, and the various qualities with which bodies are endowed, natural history is likewise, to a certain extent, capable of affording indications of the virtues of remedies. Thus, in the vegetable kingdom, the different species of the same genus, and even the different genera of the same natural order, are composed of substances which frequently exert the same actions on the living system; yet to this connexion there are exceptions so numerous and important, that it is incapable of just ap-

plication to any considerable extent ; it can only suggest conjectures, which require to be brought to the test of experiment.

The more full description of the sensible properties of the articles of the *Materia Medica*, affords the most obvious method of distinguishing them, and in many cases the easiest and most certain criterion of their purity and perfection.

It has likewise been imagined, that the sensible qualities of medicines afford indications of their peculiar powers. Those, for example, which are inodorous and insipid, are seldom active remedies ; and those which have a similarity in taste or in flavour, have also a general resemblance in their virtues. But though indications of this kind may be partially true, they are extremely limited in their application, and are liable to many causes of obscurity and error.

The *CHEMICAL HISTORY* of the articles of the *Materia Medica*, embraces several important subjects of inquiry.

Their analysis, especially that of those belonging to the vegetable kingdom, has been supposed capable of leading to a knowledge of their virtues ; and the opinion does not *à priori* appear improbable, since the medicinal powers of any compound body, in common with its other internal properties, must arise from its peculiar composition. Without any reference, however, to the very imperfect analyses of the older chemists, it may be remarked, that even from the researches of modern chemistry little information of this kind can be acquired. It may be discovered, indeed, in what proximate principle of any vegetable substance its virtues reside ; but this affords no previous indication of these virtues. Nor can the analysis of these principles explain the source of the powers which are attached to them in particular substances ; the peculiarities of composition from which these may originate, being by far too subtle to be detected by chemical means.

Chemistry, however, is in other respects more directly useful in its application to the *Materia Medica*. It enables us, by the use of proper solvents, or by the due applica-

tion of heat, to separate those proximate principles of vegetables in which their virtues reside, from other inert or noxious matter with which they may be mixed; it ascertains how far these processes are useful, points out those changes in composition by which the virtues of the substances acted on are frequently altered, and the means by which such injuries may be lessened or prevented. Similar advantages are obtained from its application to the few products of the animal kingdom that are used in medicine. Those which are derived from the mineral kingdom, can be employed with advantage and discrimination only when their composition is known; and the analyses of these substances have exploded many errors respecting them, have enabled us to distinguish them from each other, have pointed out the identity of others, and have rectified the processes by which they are prepared.

By new combinations, Chemistry furnishes us with many remedies equally active and important with those afforded by nature; and by pointing out the mutual chemical action of different substances, it guards against the errors which might arise from improper mixtures.

The last object in the study of the *Materia Medica*, that to which the others are merely subservient, is the MEDICAL HISTORY of its articles; the investigation of their virtues, or their practical uses in the treatment of disease.

This includes, in the first place, the consideration of the actions of these substances on the system, in general, as, this being ascertained, leads to their application to the treatment of morbid affections.

It is likewise necessary to investigate, so far as it can be done, the *mode* in which remedies act, either in the healthy or in the diseased state, and by which they produce their peculiar effects. We are thus better enabled to diversify their application, to determine the cases to which each may be more peculiarly adapted, and to discover the various circumstances by which their operations are influenced.

In considering the practical uses or applications of remedies, the objects demanding attention are the various kinds and forms of disease to which they are adapted, the circumstances that may render their exhibition improper in particular cases, the cautions necessary in their use, their doses, together with their usual and proper modes of administration, and the effects of their combinations with each other.

PHARMACY is the art of Preserving, Preparing, and Compounding Medicines.

The **PRESERVATION** of Medicines is its least extensive part. It includes principally the general rules for collecting plants at certain seasons, or in particular states of maturity, and those by which they are dried or preserved from the injuries they would sustain by exposure to light, air, and moisture. It comprehends, in like manner, rules for the collection and preservation of animal and mineral substances.

That part of Pharmacy termed the **PREPARATION** of Medicines, includes a variety of important operations.

The virtues of those remedies which are derived from the vegetable kingdom, generally depend on one or other of the proximate principles of each substance; on its gum, its resin, essential oil, or some other. These different principles are dissolved by different agents, by water, alcohol, &c.; and as they are often, as they exist in the entire vegetable, mixed with much inert matter, it is of advantage to extract the active principle by means of its proper solvent, and to exhibit it in its pure and concentrated state. Hence have arisen the various pharmaceutical preparations of infusions, decoctions, tinctures, extracts, &c. these being all processes by which the active matter of any substance is separated from the inert matter with which it is naturally mixed, and differing from each other only in the solvent employed, or in the form to which the solution is reduced.

Sometimes, also, the principles of these substances are extracted by other means, as when an unctuous oil is obtained by expression, or an essential oil by the appli.

cation of heat. This oil may also be combined with water or alkohol, and thus distilled waters or spirits are formed.

By such processes, we extract only a principle previously existing in any particular substance; we form no new remedy, but merely obtain the same virtue in a different form. In other cases, Pharmacy produces remedies altogether new. These are always the result of chemical action; they are either compounds. produced by the combination of two or more chemical agents, or they are the products of chemical decomposition. In this manner are obtained the various saline and metallic preparations. These preparations, too, are often dissolved in various fluids, in order that they may be conveniently exhibited; processes analogous to the infusions or tinctures of vegetable substances.

COMPOSITION is the last part of Pharmacy. In this no chemical combination is effected; but different medicines are merely mixed together, with the intention of promoting their efficacy, of correcting their operation, of covering their taste or flavour, or of giving them a commodious form.

From this view of the objects of Pharmacy, it is evident, that it is principally a particular application of Chemistry. Its operations are either directly chemical, or require that the chemical properties of the bodies operated on should be accurately known.

PART I.

GENERAL PRINCIPLES OF PHARMACEUTIC CHEMISTRY.

PHARMACEUTIC CHEMISTRY is that department of chemical science which investigates the composition and chemical relations of bodies with a view to their medicinal properties, and explains those operations by which they are fitted to act with more efficacy or safety as remedies against disease. It includes those facts and principles which connect *Materia Medica* and Pharmacy, the enumeration of which forms the proper introduction to the study of these two branches of medicine.

SECT. I. PHARMACEUTICAL OPERATIONS.

THE phenomena which it is the object of Chemistry to investigate, and upon which, therefore, the principal operations of Pharmacy depend, arise principally from the exertion of that power possessed by the particles of different kinds of matter, by which they have a tendency to combine together. When two different bodies are placed in contact, under certain circumstances, they unite, and form one homogeneous substance, in which the particles of either can no longer be discovered. The power whence this combination proceeds, is termed *Chemical Attraction* or *Affinity*. It is exerted only between the *minute particles* of *different* kinds of matter, and between these only at insensible distances. The substances which it combines never separate spontaneously, nor are they capable of being separated by any mechanical means; and they

form a compound possessing properties more or less different from those of its component parts.

The change of properties from combination is the most remarkable phenomenon attending the exertion of chemical attraction. The sensible qualities, and chemical properties of the compound, bear in general no resemblance to these qualities and properties in the substances of which it is formed. This, however, is not invariably true. There are a number of instances, especially in Pharmacy, where the change is much less complete, as in the solutions of resins or essential oils in alcohol, or of gums or saline substances in water. But in these the marks of chemical combination are still present, the compound is homogeneous, and cannot be decomposed but by the exertion of a superior affinity.

Chemical attraction is not invariably or equally exerted by each substance to every other. Between many substances there seems to exist no attraction, at least they cannot be made to combine together. Others have a very extensive power of combination, and seem capable of uniting with almost every substance which is not already saturated with them; and there are many intermediate, in their facility of combination, between these two extremes.

Chemical attraction is not limited, in its action, to two bodies. It can be exerted between three, four, or more, and can thus form compounds of so many principles. It can likewise unite bodies in different proportions. Some combine in every proportion, others only in limited quantities. In the latter case, the compounds formed by the different proportions have in general very different properties.

The compounds which are thus formed, have still the same relation to chemical attraction. They have a tendency to combine with other bodies, simple or compound; they can combine in various numbers and proportions; and these combinations are accompanied by the same phenomena, and regulated by the same laws.

The attraction exerted by any substance towards others, is not uniform in its force. To some it is stronger, to

others weaker. Hence it follows, that if two bodies have been combined together, they may be separated, or the compound they have formed may be destroyed, by presenting to it another substance, which exerts an attraction to one of its component parts, superior to the attraction by which they were held united. If the circumstances necessary to favour the exertion of chemical attraction be present, the two bodies between which there is the strongest attraction combine, and the other is separated. In chemical language this process is termed *Decomposition*, from a single elective attraction.

A case of decomposition, more complicated, is that, where two compounds are mixed together, and where the constituent parts of the one exert attractions to those of the other stronger than the attractions by which they are held combined in the original compounds. In this case, a complete exchange takes place, and two new compounds are formed. This is termed *Double Decomposition*, or the exertion of a double elective attraction. Tables have been constructed of the relative forces of attractions of many bodies towards others, whence may be estimated the combinations or decompositions that will take place on their mixture with each other.

The exertion of chemical attraction between bodies is greatly influenced by another power, that of heat or *Caloric*. This is the cause of the temperature of bodies, of their expansion, fluidity, and conversion into the *aëriform* or gaseous state. Its influence on chemical combination and decomposition is very extensive. Some bodies combine together at the common temperature of the atmosphere; others require that temperature to be raised; and in some it is necessary to expose them to a very intense heat. The same differences take place with respect to decomposition. Many bodies remain in chemical union within a certain range of temperature, more or less extensive; but whenever the heat, to which the compounds in which they exist are exposed, is increased beyond a certain degree, decomposition takes place, and the constituent principles are separated from each other. These effects are partly to be explained from the power caloric has of weak-

ening the force of aggregation in bodies by which their particles are held in union, and by which that power tending to separate them, in order to bring them into a state of new combination, is counteracted; and partly from the state of expansion or of fluidity produced by caloric, by which the surfaces between which chemical attraction is exerted are increased, and the minute particles of bodies are brought to act upon each other.

The OPERATIONS OF PHARMACEUTIC CHEMISTRY are entirely dependent on chemical attraction, or on the action of a caloric. They are merely particular arrangements of circumstances, by which the exertion of that attraction is promoted, and the products of the combinations or decompositions which take place are obtained.

There are several preliminary operations, not directly chemical, but employed either to favour the exertion of chemical attraction, or to facilitate the medicinal operation of the substances subjected to them. They are those operations, by which bodies are reduced to a state of extreme mechanical division. The principal are PULVERIZATION, or reducing bodies to powder by beating; TRITURATION, in which the same effect is obtained by rubbing; and LEVIGATION, in which the powder is reduced to a greater degree of fineness, from the rubbing being continued longer, and being facilitated by the addition of any fluid which does not act chemically on the substance subjected to the operation. These are performed in mortars of glass, earthen-ware, or metal. As the particles into which the substance is reduced by any of these means, must necessarily be of unequal fineness, the coarser are separated from the finer, by SIFTING or passing the powder over a sieve. WASHING or ELUTRIATION is an operation in which the same end is attained. The powder is agitated in a fluid, in which it is not soluble; the larger particles are allowed to subside; the liquor, holding the finer suspended, is poured off; and, on it remaining at rest, are deposited. These methods can be applied to few of the metals with advantage. They are, therefore, mechanically divided, by filing, by beating into fine leaves, or by pouring them when melted into water; an operation termed Granulation, as the metal becomes solid, in the form of small grains.

These operations do not directly promote chemical action, as they are far from reducing bodies to their minute particles, between which that action is exerted: they are merely employed as preliminary to those which are more directly chemical. In pharmacy, some of them are of utility, besides promoting chemical combination, as there are several medicines which act with more certainty and power when finely levigated, than when given in a coarser powder.

Of the CHEMICAL OPERATIONS, the most important are those by which that fluidity is obtained, which is in general requisite for the exertion of chemical attraction. SOLUTION is the principal operation of this kind. It is that process in which a solid body, when immersed in a fluid, disappears, so that its particles are no longer discoverable, and upon standing do not subside, the fluid likewise retaining its usual transparency. It is merely an example of chemical combination between two bodies, which happen to exist in different forms, the compound remaining in the fluid state. The fluid being conceived to be the more active substance, has been termed the Solvent, the solid the Solvend or body dissolved. The attraction, however, whence the solution proceeds, is reciprocal, and is not more exerted by the one than by the other.

The previous mechanical division of solids, promotes their solution, by enlarging the surface between which the mutual attraction is exerted. Agitation causes the solution to proceed more rapidly, by bringing successively the different parts of the fluid into contact with the solid.

There are, in general, certain limits to the solution of solids in fluids. A certain quantity of sea-salt, for example, may be dissolved in a given quantity of water; but if more be added, it remains undissolved, and can only be diffused through the solution. When the fluid has taken up as much of the solid as it can dissolve, it is said to be *saturated* with it. The same fluid requires for its saturation very different quantities of solids; of some it can dissolve only a very small portion, of others more than its own weight. The saturation of a fluid with one substance, does not prevent it from dissolving a portion of

a second, or even of a third or fourth, though it lessens the solvent power with regard to each. There are some cases in which the solvent power is apparently unlimited, or in which no precise point of saturation can be pointed out, such as the solution of sugar, gums, &c. in water.

The temperature or degree of heat has a very important influence on solution, and in varying the point of saturation. In general every solution proceeds with more facility or rapidity at a high than at a low temperature, and the fluid is even capable at the high temperature of dissolving a larger portion of the solid, though with respect to different solids, this increase of solvent power, by a given temperature, is very different.

Solution, besides being one of the most important operations in chemical analysis, is one of the most useful in pharmacy, the active principles of many substances being extracted, by means of their proper solvents. Saline substances are dissolved in water, as are also gum, sugar, and other vegetable and animal products. Resins, camphor, essential oils, &c. are dissolved in ether, alkohol, or wine; and metals are rendered soluble and active by the different acids. The operation receives different appellations, according to the nature of the solvent, of the substances dissolved, and of the manner in which it is performed. When we have a mixture of saline or earthy substances, of which part is soluble in water, or in any other fluid, while another part is insoluble, the one may be separated from the other by the due application of its proper solvent. The process thus performed is termed **LIXIVIATION**, and the solution obtained, a **LEY**. When a fluid is poured on any vegetable or animal substance, so as to dissolve only part of its principles, the operation is termed **EXTRACTION**, and the part dissolved is said to be extracted. If it is performed without the assistance of heat it is termed **MACERATION**; if with a moderate heat, **DIGESTION**; if the fluid be poured boiling hot on the substance, and they are kept in a covered vessel till cold, it forms **INFUSION**. Lastly, **DECOCTION** is the term given to the operation where the fluid is *boiled* upon the substance to be dissolved.

To obtain the solid matter which has been dissolved in any fluid, the process named EVAPORATION is employed. The liquor is exposed to heat in a vessel of such a form as to present a wide surface to the atmosphere; the fluid is converted into vapour, and the matter that had been dissolved is thus obtained in a solid state. The heat employed in evaporation should always be as moderate as possible, as the flavour of the solid residuum is otherwise apt to be injured, its composition changed, or part of it carried off with the vapour. In many cases, the heat afforded by placing the vessel containing the fluid to be evaporated over boiling water is sufficient. This forms the *Water Bath* or *Balneum Mariæ*.

There are many substances, especially those belonging to the class of Salts, which, when their solutions are evaporated to a certain extent, concrete in masses of regular forms, hard and transparent. These are termed *Crystals*, and the operation itself CRYSTALLIZATION. The first step in this process is to evaporate part of the fluid till the solution while at its boiling point is saturated, or retains in solution the largest quantity of the body which at that temperature it can hold dissolved. On allowing it to cool, the portion which the high temperature enabled the fluid to hold in solution, will separate, and crystals will be formed; and by successive evaporations, the whole of the solid matter may be obtained in the crystalline form. In like manner, crystals are formed by the slow or spontaneous evaporation which takes place when a fluid is exposed to the atmosphere, and these being formed more slowly, are even harder and more perfect in their figure than those obtained by hasty evaporation.

In crystallizing, the figure which the body assumes, is regular and peculiar to itself, and hence is established the arrangement of crystals into prismatic, rhomboidal, and other forms; these, however, are frequently varied by external circumstances.

Water is essential to the formation of crystals, and gives them their transparency. The crystals of different bodies contain very different quantities of this fluid. It is termed their *Water of Crystallization*; and by whatever

means it is expelled, the transparency, density, and figure of the crystal is lost. If crystals lose their water of crystallization on exposure to the air, they are said to *effloresce*; if, on the contrary, water is absorbed, so that the substance becomes moist or fluid, it is said to *deliquesce*.

Crystallization is promoted by the access of the atmospheric air to the fluid, and by affording a nucleus or solid point at which the crystallization may commence. Some substances have so strong an attraction to the fluid in which they are dissolved, that they do not separate in the crystalline form, even when the solution has been considerably evaporated. They either remain dissolved, forming a liquor more or less glutinous; or if the evaporation be carried to a greater extent, they are recovered in the solid form, but destitute of any regular figure. Some of these bodies, when dissolved in water, may be made to crystallize by the addition of a small quantity of alcohol, which, by exerting a still stronger attraction to the water, weakens their combination with it. Other substances soluble in water, as gum, starch, &c. can by no management be made to undergo this operation.

Besides this species of crystallization, there is a process of a similar kind to which the same term is applied. When a body has been melted, if the fluid has its temperature slowly reduced, so that it approach gradually to the point at which it becomes solid, its particles frequently unite, so as to form masses of regular figures, or crystals. This species of crystallization is not however, applied to any pharmaceutical purpose.

PRECIPITATION is another process by which a solid body is separated from a fluid. If, for example, to the solution of any solid matter in any fluid, a substance be added, which has a stronger attraction to the fluid than the solid previously dissolved in it has, the latter will be separated, and will be thrown down in its solid form. In like manner, precipitation may take place from the substance which is added combining not with the fluid, but with the solid dissolved, and forming with it a new compound no longer soluble. The process, in either case, is termed *Precipitation*, the substance thrown down is a

Precipitate, and the substance by which the precipitation has been effected, is the *Precipitant*.

In order to obtain a precipitate pure, it is allowed to subside; the clear liquor is poured off, the precipitate is repeatedly washed, to carry off any of the substance by which it was precipitated, which may still adhere to it; it is then dried.

The preceding operations are those in which a solid body dissolved in a fluid is recovered by abstracting part of the fluid. But there are many cases of combination, or decomposition, in which our object is rather to obtain the more volatile part of the mixture. In such cases *Distillation* and *Sublimation* are had recourse to.

In DISTILLATION, the materials are exposed to a proper degree of heat, in vessels contrived so as to collect the part which passes off in vapour, condense it, and thus obtain it in the fluid form. Distillation is therefore nothing but evaporation in close vessels, with the design of obtaining the volatile products.

In many cases of distillation, the matter to be distilled is apt to be injured by the application of too strong a heat; such, for example, is the case with regard to the essential oils of plants. To prevent this, they are not exposed alone to heat, but with the addition of a quantity of water. The temperature at which water is converted into vapour, (212° of Fahrenheit) is sufficient to volatilize these oils, without injuring them. The oil therefore rises with the vapour, is condensed with it, and is easily separated from the water, by their difference in specific gravity, a small quantity of it only being lost by being retained by the water in solution.

When the substance to be distilled is not of such a nature as to act chemically on metallic vessels, the common still, made of iron or copper, is employed. This is a cylindrical vessel, from the head of which a pipe issues, which is connected with a spiral tube, placed in a vessel filled with water. The heat is directly applied to the bottom of the still; the vapour produced passes off through the tube, and is condensed in the spiral tube (or worm as

it is termed), the cold water with which this is surrounded promoting the condensation.

Acids, or other substances that would act upon metallic vessels, or receive from them a noxious impregnation, are distilled from glass vessels. The Retort, or conical bottle bent nearly at a right angle, is used for this purpose; the heat being communicated to it by the medium of a sand-bath. The vapour is condensed in a conical or globular vessel, termed a Receiver, connected with the retort. Where the vapour is highly elastic or difficult of condensation, a series of receivers connected together is necessary; and where it is incapable of condensation by itself, but is easily absorbed by water, a portion of that fluid is disposed in the receivers, by which it is condensed. Some bodies are impure on their first distillation; they are purified by a second distillation, which is then termed *Rectification*. Or, with the proper product of the distillation, a portion of aqueous vapour may have passed over: this may be abstracted by exposing the distilled fluid again to heat, and the process is named *Concentration* or *Dephlegmation*.

SUBLIMATION is another operation, by which a volatile matter is separated from one more fixed, by the application of heat; but the matter volatilized is again condensed, not in the fluid but in the solid form. The operation, therefore, is generally performed in one vessel, the sublimate being condensed in the upper part. When it concretes, in the form of light flakes, it was termed *Flowers*, in the old language of pharmacy.

FUSION is, next to solution, the principal operation by which chemical combination is promoted. It is adapted to those cases in which the bodies designed to act upon each other are not soluble in any fluid, or at least in none that does not alter their attractions. The fluidity necessary for their mutual chemical action, is therefore given to them by the due application of heat. The operation is commonly performed in vessels termed *Crucibles*, which are cups made of earthen-ware, of black-lead, or of some metal; the necessary heat being excited and communicated in general by a furnace.

Chemical combination is also frequently promoted by the application of heat, even though the bodies are not fused. *Calcination* is an operation of this kind. It is merely the exposing of a metal to a high temperature, with the free access of atmospheric air, by which it is oxygenated. *Deflagration* is an operation of a similar kind. It consists in mixing some salts, especially nitrat of potash, in which a large quantity of oxygen is retained with a very weak attractive force, with any inflammable body, and exposing the mixture to heat. The oxygen is attracted by the inflammable substance, which is thus oxydated.

Chemical decomposition is, in like manner, promoted by an increase of temperature. One principle of a compound, which is disposed to volatility, may thus be expelled; or two bodies, one or both of which are compounds, and which when mixed together have no action on each other, may, when exposed to a strong heat, exert attractions, by which their decomposition is effected.

These are the principal operations of pharmacy. Connected with this branch of the subject, there remain to be noticed the measures and weights which are usually employed. *Troy weight* is that ordered to be observed in the different Pharmacopœias. The pound is divided into twelve ounces; the ounce into eight drachms; the drachm into three scruples; and the scruple into twenty grains. Measures are rejected by the Edinburgh College, but are admitted in other Pharmacopœias, and used by the apothecaries. They are subdivided in a similar manner, and are made to answer to the specific gravity of water. A table-spoonful and tea-spoonful, (measures frequently employed), are understood to be equal, the former to half an ounce, the latter to one drachm.

SECT. II. CHEMICAL ANALYSIS OF THE ARTICLES
OF THE MATERIA MEDICA.

THE consideration of the general analysis of the substances employed as remedies, must necessarily precede their particular history, as it is so intimately connected with the observations to be made on their properties, the marks of their purity and perfection, their actions on each other, their combinations, and pharmaceutic treatment.

CHEMISTRY arranges all bodies under two classes; those which are Simple, and those which are Compound. The former are such as consist merely of similar parts; the latter such as can be resolved into parties different in their properties from each other, and from the compound which they had formed. From the combinations of a few simple substances, originate all the productions of nature, and all those which are the results of the operations of art.

It is the province of chemistry to trace these combinations, to determine whether bodies are simple or compound; and, if compound, to ascertain the number and proportions of their constituent parts, and the modes in which they are combined. These objects are attained by Analysis and Synthesis, two general operations, comprehending the greater number of the processes of chemistry.

Analysis is the decomposition of a compound, or the separation of its constituent parts. It is effected, either by exposing it to heat, when, from the unequal action of the caloric on the particles of which it is composed, they are separated from each other; or, by subjecting it to the action of a superior attraction, in other words, by presenting it to some substance which exerts an attraction to one or other of its component parts, superior to the attraction by which these were held united.

When the analysis has been effected, we may often again combine the principles obtained, so as to form the compound that has been decomposed. This forms what is termed Synthesis, which, when it can be effected, is always

a proof of the accuracy of the analysis. Very frequently, however, in the decomposition of a compound, the principles that are separated, instead of passing off pure, combine in new modes and proportions, and form compounds, which then become the products of the analysis. These cannot be combined again, or, if they could, they would form a compound totally different from the substance originally analysed. They may, however, be subjected to a further analysis, and thus the ultimate principles of the compound may be accurately ascertained. The whole of the substances belonging to the vegetable and animal kingdoms are subject to this complicated analysis.

In analysing the various products of nature, we ultimately arrive at a few substances which we are unable farther to decompose, and which are therefore regarded as *simple*. Their absolute simplicity is not indeed established, but is inferred, till their composition be proved. They are simple with regard to our present knowledge of them, that is, they consist of particles, which, so far as can be discovered, are similar to each other, and they are regarded as the elements of which all other bodies are composed. It is sufficient to state their distinguishing characters, and the principal compounds which they form.

The first order of these substances, those which seem best entitled to the character of simplicity, are the SIMPLE GASES, Oxygen, Azot and Hydrogen. Modern chemistry has demonstrated, that these gases are solid substances, brought into the aerial form by the operation of caloric. In the new nomenclature, therefore, the name of each is given to the base, and from this the appellation of the air or gas is derived.

Of these simple bodies, OXYGEN is the most important, since it is either capable of combining with, or forms a component part of the greater number of the productions of nature. Like other gases, it is invisible, and permanently elastic; its specific gravity is a little superior to that of atmospheric air. Its distinguishing characters are its capacity of supporting combustion and animal life. It is indeed the only substance that can support either of

these processes, and it is absolutely necessary to enable them to be carried on.

The influence of this air in supporting combustion, is more particularly to be assumed as its distinguishing chemical character, since so many of the most important chemical agents are formed by this operation. It is proved by the most unequivocal experiments, that combustion is nothing more than the combination of oxygen with the combustible body. Burnt bodies are therefore merely substances combined with oxygen: that principle is contained in them in very various quantities, and is retained by very different degrees of attractive force.

Many substances can also be combined with oxygen, without the phenomena of combustion taking place, that is, without the disengagement of light and caloric. This happens when the oxygen has been previously combined with another body, and is only transferred from it by the exertion of a superior affinity. It happens, too, when the oxygen is slowly absorbed from the atmosphere, at the natural temperature. It is thus that many animal and vegetable substances are altered by exposure to the air. The absorption in these cases is so gradual, that the caloric, and perhaps the light, which are disengaged, are not perceptible.

The compounds resulting from the union of oxygen with other bodies, are among the most active of the chemical agents.

It forms one-fourth part of the atmospheric air, and it is principally upon its action that the many chemical changes produced on bodies by that air depend. United with hydrogen, it forms water, the substance which of all others has the greatest share in promoting chemical combinations.

Another order of important compounds resulting from the union of oxygen with other bodies, is that of *Acids*. These are distinguished by their sour, styptic taste; by their greater or less causticity; by their changing the vegetable colours to a red; and by their combining with the alkalies, earths, and metals, forming peculiar compounds in which the acid properties are totally lost. They are

compounds of inflammable substances with oxygen, and this element derives its name from being the principle of acidity.

With the same substance oxygen is capable of combining in different proportions, so as to form different acids, the more powerful acid being generally formed by the larger proportion of oxygen.

The nomenclature of the acids is designed to express these facts. The name of each acid is derived from the substance of which, combined with oxygen, it is formed; and by a variation in termination, the different acids resulting from the different degrees of oxygenation of this base are denoted; the name of the more perfect acid terminating in the syllable *ic*, that of the one with the less proportion of oxygen in *ous*. Thus sulphur, with two proportions of oxygen, forms sulphureous and sulphuric acids.

Acids have a great tendency to combination. From this, and from the facility with which they are in general decomposed and part with oxygen, they are the most active of any of the compound chemical agents, and are used in many pharmaceutic operations.

Lastly, oxygen unites with many bodies without rendering them acid; it then forms an order of bodies termed **OXYDS**. It in general communicates to them a greater tendency to combination. To this order belong almost all the compounds it forms with the metals, and the greater number of the vegetable and animal products.

The second of the Simple Gases is **AZOT**. Like oxygen, when pure, it exists always in the gaseous form, forming azotic gas. This gas, with less than one-fourth part of oxygen, constitutes the common atmospheric air. It possesses no remarkable property by which it may be characterized, and therefore it is rather distinguished by its negative qualities. It is lighter than atmospheric air, its specific gravity, compared with it, being as 985 to 1000; it is unable to support combustion or respiration; it is not absorbed by water, at least in any considerable quantity; and it is not inflammable in the strict sense of the term, for although it combines with oxygen, yet the

combination is not sudden, nor is it attended with the emission of light, and with scarcely any extrication of caloric.

Azot combined with oxygen, in proportions in which these two elements are mutually saturated, forms a powerful acid, the Nitric; with a smaller proportion of oxygen it forms the Nitrous Acid. These acids are very easily decomposed, and hence are often employed in chemical operations to afford oxygen to other bodies. With smaller proportions of oxygen, it forms two gases, neither of which has acid properties; Nitrous Gas, composed of 44 of azot with 56 of oxygen, distinguished by the facility with which it unites with an additional proportion of oxygen; and Nitrous Oxyd, consisting of 63 of azot, and 37 of oxygen, peculiarly characterized by its high exhilarating powers on the animal system. Combined with hydrogen, in the proportion of 121 parts to 32, it forms Ammonia, or Volatile Alkali, and hence it has been supposed, from analogy, that the other two alkalis also contain azot as a constituent principle.

Lastly, azot is contained in great abundance in animal matters, and is the principle which distinguishes them, by their chemical composition, from vegetables.

The last of these simple airs is HYDROGEN. It is the lightest of all the gases, its specific gravity, when it is in its purest state, being to that of atmospheric air as 13 to 1. It is highly inflammable; one part of it mixed with four parts of atmospheric air, exploding with violence on the approach of an ignited body.

The most important compound of hydrogen is Water, formed by its union with oxygen, in the proportion of 15 parts, by weight, of the former to 85 of the latter. As a chemical agent, water is of the first importance, both from its very extensive power of combination, and from its agency in affording oxygen. It is the solvent of all saline, and of the greater number of the earthy substances; and it likewise dissolves a number of the vegetable and animal products. In these combinations, it is singular that the general law of chemical attraction, (that combination which alters the properties of bodies,) is scarcely ob-

served; the properties of the bodies dissolved by water remaining almost invariably nearly the same, and that fluidity being merely communicated to them which is necessary for their mutual chemical action, or which renders convenient their preparation as medicines.

Water is farther an important chemical agent, by affording oxygen to a number of bodies. Thus, many of the metals are slowly oxydated by it; and in their solutions by acids, it is frequently from the water that the metal receives oxygen. The vegetable and animal products receive oxygen also from the water they contain; and in the decompositions which they suffer, whether from the reaction of their principles at a natural temperature, or by exposure to heat, the elements of the water present enter into the composition of the products which such analyses afford.

Under the appellation of SIMPLE INFLAMMABLE SUBSTANCES, are commonly described three bodies, Carbon, Sulphur, and Phosphorus. They exist in the solid form, but are totally destitute of the metallic splendor, opacity and gravity. They are highly inflammable, and form acids when united with oxygen.

CARBON, the first of these, is an inflammable matter, the basis of common charcoal. In this substance, it was supposed to be merely mixed with oxyd of iron, and some other impurities. But the experiments of Guyton have proved that it is also combined with a portion of oxygen, and that the *Diamond* is the pure inflammable base. Charcoal therefore, or the black porous substance which remains after the imperfect combustion of wood, is an oxyd of carbon containing 36 parts of oxygen in the 100. It is inflammable. Combined with a larger quantity of oxygen, it forms a gas still possessing the property of inflammability, the Gaseous Oxyd of Carbon. Saturated with oxygen, it forms a gas possessing the properties of an acid; Carbonic Acid, or what was formerly named Fixed Air. Its acid powers are extremely inconsiderable, and its attractions so weak, that it is displaced from its combinations by all the other acids. Carbon, with hydrogen and oxygen, forms several compounds pos-

sessing inflammability. Some of them exist in the gaseous form, and differ slightly in their properties from each other. Alcohol, which is the product of fermentation from sugar, and which when pure is a colourless fluid, fragrant and pungent, volatile and inflammable, is a compound of a similar kind; and Ether, which is formed by the action of acids from alcohol, and which is still more light and volatile, is nearly of the same composition, differing from alcohol principally in containing a larger proportion of hydrogen.

SULPHUR is a simple inflammable substance found in abundance in nature, either pure or in combination with metals. When pure, it is hard and brittle, semitransparent, of a light yellow colour, insipid, emitting when slightly heated a fœtid smell. It melts and volatilizes at a very low temperature, that of 185° ; at a temperature of 302° , it burns with a blue flame, when atmospheric air is admitted.

Sulphur combines with oxygen, hydrogen, phosphorus, with many of the metals, and indeed with the greater number of the simple bodies. Its combination with oxygen forms the Sulphuric and Sulphureous Acids. The latter is gaseous, has a pungent suffocating odour, and does not possess the acid properties in a very eminent degree. The former is fixed and inodorous; in the general acid powers it is superior to any body of the same class; it has a strong attraction to water, and is always combined with it; it exerts also strong affinities to the alkalies, earths and metallic oxyds, and oxydates the metals, and the greater number of inflammable bodies. It is therefore extensively used in chemical and pharmaceutical operations.

With hydrogen, sulphur forms a compound, Sulphurated Hydrogen, which exists in the aerial form, and is distinguished by its very fœtid smell. It resembles the acids in several of its properties. Sulphur is also a component part of some animal substances, and it has even been detected in a few vegetables.

The last of these simple substances is PHOSPHORUS, a substance with which we have been made acquainted

only by the art of the chemist. It exists no where pure and uncombined, but its acid is found in great abundance in nature. In the fossil kingdom, it is combined with several of the earths and metals, and it forms a component part of many animal and several vegetable productions.

Phosphorus is always obtained by decomposing this acid, by heating it with carbon, which attracts its oxygen. The phosphorus is sublimed in close vessels; it is of a soft tenacious consistence like wax; transparent, of a pale yellowish colour. It emits fumes, which are owing to its combination with the oxygen of the atmosphere. From this combination, two acids are formed, according to the proportion of oxygen: the Phosphorous, which is fœtid, and when heated, emits luminous vapours; and the Phosphoric, which is inodorous, and more powerful as an acid than the other. Phosphorus is one of the component principles of animal substances.

Besides the acids formed by the oxygenation of these simple inflammable bodies, there are three not yet decomposed, but which are supposed from analogy to be of a similiar composition; the Muriatic, Fluoric, and Boracic.

The MURIATIC ACID exists in sea-salt, and in various other natural substances. In its pure state it is gaseous, has a pungent suffocating odour, and extinguishes combustion. It is rapidly absorbed, and in large quantity, by water; and it is under the form of this solution that it is generally used. It possesses in an eminent degree the general acid properties. It combines with the alkalies and earths; and though incapable of affording oxygen directly to the metals, it effects the oxydation of many of them, by enabling them to decompose the water it contains. This acid is capable of being combined with a considerable proportion of oxygen, forming the Oxy-muriatic Acid. The acid powers of this are inferior to those of the simple muriatic acid; but parting with facility with the oxygen combined with it, it acts with more energy on many inflammable substances.

The Fluoric and Boracic Acids cannot be regarded as pharmaceutic agents.

The METALS, the third order of simple substances, are distinguished by their opacity, brilliancy, fusibility, ductility, malleability, and by specific gravity superior to that of any other class of bodies. They are truly inflammable, since they are capable of combining with oxygen, and many of them during their oxydation emit light and caloric. It scarcely comes within the limits of pharmaceutical chemistry to notice all the metals particularly: it is sufficient to take a general view of their properties, and of their influence in combination.

The metals are very various in their degree of fusibility. Mercury does not become solid but at a temperature equal to 40 degrees below 0 of Fahr., while iron or platina requires a very intense heat for its fusion. They differ also in their ductility and malleability. Gold is at once the most ductile and most malleable, that is, it can be drawn into the finest wire, and beat into the thinnest plates, without its texture being injured. The other metals possess these properties in different degrees, some being ductile which are scarcely malleable, and *vice versâ*. Others are neither ductile nor malleable. These have been improperly termed Semi-metals. Specific gravity is the property by which the metals are most clearly distinguished. The specific gravity of the heaviest stone is to that of water as 4 to 1, while that of the lightest metal is as 6 to 1.

Metals are very susceptible of combination. They unite with sulphur, with phosphorus, and with each other. Their combinations with oxygen are the most extensive and important.

This combination is effected in different ways. When raised to a temperature more or less high, with the access of atmospheric air, they attract oxygen; some are oxydated rapidly, and exhibit all the phenomena of combustion; others undergo this operation much more slowly; and there are some (gold, silver and platina) which can scarcely be oxydated in this manner. Several of them are oxydated by the agency of water. It is thus that iron and some others, especially when assisted by a high temperature, attract oxygen from water, the hydrogen being disen-

gaged. Lastly, all of them may be oxydated by the action of acids. The acid itself is not only decomposed, by its oxygen being attracted by the metal, but its presence enables several of the metals to decompose the water present with great rapidity.

The results of these combinations are compounds, which in general belong to the class of oxyds. They are destitute of the metallic qualities, and are more similar to earths, being in general insipid, insoluble in water, and vitrifiable by heat. Four metals, Tungsten, Molybdena, Arsenic, and Tin, can be so highly oxygenated as to pass into the acid state.

Metals attract very different quantities of oxygen. Some combine with only a small proportion of that principle, while others can take up nearly their own weight.

Each metal, too, combines with certain different proportions, and the oxyd produced by each proportion differs in its properties from that produced by the others. The first degree of oxygenation generally produces an oxyd, having a colour not much different from that of the metal: by higher oxygenation, more brilliant colours are produced.

Metals also attract oxygen with very unequal degrees of force. Hence one metal can often be oxydated merely by heating it with the oxyd of another. Some oxyds, too, as those of gold, silver and mercury, are decomposed by the mere agency of caloric, at a temperature not raised very high, and even by the action of light at the natural temperature.

It is principally from their combination with oxygen that metals derive their activity. They are, for instance, incapable of combining with the earths, unless they have been previously oxydated. The ease is the same with respect to the acids. If the metal has not been previously oxydated, it immediately decomposes either part of the acid, or of the water present, and then this oxyd combines with the remaining acid. The union of the different metals with the different acids, is much influenced by the degree of their oxygenation; and at a high degree of oxygenation they frequently become incapable of com-

bining with the acid. Hence, many metallic solutions are decomposed by exposure to the atmosphere; the metal attracting more oxygen, and becoming insoluble in the acid. In the same manner, heating a metallic solution, often decomposes it, as it enables the metal to attract more oxygen from the acid. The different oxyds have very different degrees of attraction to the acids, and hence some are able to decompose the combinations others form.

Metals are rendered active on the system, only by being combined with oxygen, or with acids. The most deleterious of them prove innocent in the metallic state, and produce their bad effects only when given oxydated, or when oxydated by some of the animal fluids. In general, they are more active the more oxygen they contain; and they are always rendered more powerful when the oxyd is farther combined with an acid. The mildest preparation of mercury, for example, is that prepared by trituration merely, in which the mercury approaches nearest to the metallic state, and the most virulent preparation of that metal is the corrosive muriat, in which it is very highly oxydated.

The last class of simple substances is the EARTHS. They have usually been defined substances, insipid, infusible, having little solubility, unflammable, having a specific gravity, compared with water as a standard, always less than 5 to 1, and combining with acids to form neutral salts. Of these characters some apply only to some earths; that of insipidity, for instance, is confined to two or three; others, as lime and barytes, being considerably sapid.

These characters too are understood as applying to pure earths; substances which, so far as has been discovered, are absolutely simple. These by combination, or intimate mixture with each other, and with other bodies, give rise to a vast variety of compounds, still distinguished by the title of Earths, but to which these characters are only in part applicable. Such compounds are not the objects of pharmaceutic investigation, it being only the pure earths, or combinations of them effected by art, that are used in medicine.

The principal earths are six; Silex, Argil, Magnesia, Lime, Barytes, and Strontites. Of late two or three others have been discovered, but in quantities so minute as not to require notice in this sketch.

SILEX, though an abundant ingredient in stones, scarcely exists pure in nature. When obtained by a chemical process, it is in the form of a light white powder. Its chemical character is its little susceptibility of combination. It unites with none of the acids, the fluoric excepted. It is dissolved by potash and soda; and by fusion it combines with the earths and metallic oxyds.

ARGIL is distinguished by insipidity, infusibility by heat, insolubility in water, and by forming a ductile paste with that fluid, but more completely by the compounds which it forms with acids. It is never used in medicine in its pure state; but some of its compounds, especially that resulting from its union with sulphuric acid, are employed. The salts formed by its combination with acids, have one general medicinal character, that of being possessed of a considerable degree of astringency.

MAGNESIA, when pure, is always in the form of a fine white very light powder. It is infusible; insoluble in less than 2000 parts of water, and does not form with it a ductile paste; is somewhat sapid; changes the colours of vegetables to a green, and forms with the acids peculiar neutral salts. It is never found in a pure state in nature, but is always the produce of art.

Magnesia, in its pure state, is extensively used in medicine, as are also several of its compounds. It is given as an antacid, and the salts it forms with the acids have all a cathartic power.

LIME is distinguished by its disagreeable, penetrating, styptic taste. It attracts water rapidly from the atmosphere; it is heated when water is poured on it, and falls into a dry white powder; it is soluble in about 700 parts of that fluid, and its solution changes the vegetable colours to a green. In the fire, it is infusible by itself; it fuses, however, when mixed with the other earths; it combines with almost all the acids.

Lime is used in medicine as an antacid, as an astringent,

and as a remedy in calculus. It is given in the form of solution in water. Some of its compounds, particularly that with the carbonic acid, are also used to correct acidity, and are sometimes preferred, as being less acrid than the pure lime.

BARYTES is distinguished by its great specific gravity, which is superior to that of every other fossil not metallic. In nature, it is always found combined with the sulphuric or carbonic acid. When pure, it is in the form of a very fine white powder; it is fusible and soluble in 20 parts of water, its solution changing the vegetable colours to a green; its attractions to the acids are in general much superior to those of any of the other earths.

Barytes has a much more powerful action on the system than the other earths have. Even in a small dose it occasions vertigo, insensibility, and other nervous symptoms. From this circumstance, as well as from its great specific gravity, some have supposed that it is a metallic oxyd, which we have hitherto been unable to decompose.

STRONTITES is, in many of its properties, similar to barytes. Like it, it is found in nature combined with sulphuric and carbonic acids, and these compounds are distinguished by great specific gravity. It is fusible, but less soluble, requiring 200 parts of water for its solution. Its saline combinations are, on the contrary, in general, more soluble than those of barytes. It has no poisonous quality, or does not appear to exert any great activity on the animal system.

The ALKALIES are somewhat analagous in their properties to the earths; they are distinguished by the following characters. They have a penetrating acrid taste; change the vegetable colours to a green; have a strong attraction for water, unite with oils, and combine with the acids, forming neutral salts. There are three substances of this kind; Potash, Soda and Ammonia. There is reason to believe that they are compounds. One of them, ammonia, is proved to consist of azot and hydrogen, which renders probable the opinion that the others are also compounds, though they have not hitherto been decomposed.

POTASH is the most powerful of these substances: it is

solid, and crystallizable, of a white colour, is highly acrid and caustic, has so strong an attraction to water as to take it from almost any other substance. It melts at a moderate temperature; by fusion with siliceous earth it forms glass; it has a stronger attraction than either of the other alkalies for the acids, and therefore the compounds it forms are not easily decomposed.

This substance is obtained from vegetable matter, principally the ligneous part. This is made to burn slowly, till its carbon is totally destroyed: a saline mass remains, which consists principally of potash. There is reason to believe that it is formed during the combustion, since, although it can be detected by other means as a component principle of vegetable matter, it is only in some vegetables, and never in such quantities as are afforded by the combustion.

The physical characters of SODA are so precisely the same with those of potash, that it is scarcely possible to distinguish them when both are in a state of purity. Soda, it is said, attracts humidity from the atmosphere less rapidly than potash.

It is by their combinations, however, that they are principally distinguished. The salts, in particular, which soda forms with the acids, are totally different in their properties from those that have potash for their base. It forms glass with silex in the same manner as potash.

Soda is obtained as well as potash by burning vegetables. It is, however, only sea plants, or those that grow by the sea-shore, that afford it: it has therefore been supposed, that these plants may contain sea-salt, or muriat of soda, and that it is from the decomposition of this salt that the soda is derived.

The third of these alkalies, AMMONIA, differs much from the others. It can never be obtained in the solid or fluid form, but when pure, is always in the state of gas: it is absorbed in great quantity by water, and thus forms a solution of pure ammonia. Its smell is extremely pungent: it is also volatile, escaping gradually from the water in which it has been dissolved: hence it has received the appellation of Volatile Alkali. It is considered as a less

powerful alkali than either of the others: it does not combine with the siliceous earth; it acts more feebly on animal matter, and it adheres to the acids with much less force.

Ammonia is composed of azot and hydrogen, in the proportion of 121 of the former to 32 of the latter. It is obtained in great quantity by exposing animal substances to heat: they are decomposed, and part of their hydrogen and azot combining form ammonia.

The alkalies are all used in medicine, and their combinations form some of the most important articles of the *Materia Medica*. They are also important pharmaceutic agents.

With the alkalies, earths, and metallic oxyds, the acids combine and form an order of compounds termed **NEUTRAL SALTS**. In these, the properties of the acid, as well as of the base with which it is united, are in general lost; the compound acquires some new properties; it has in general a considerable attraction for water, and it is capable of assuming a crystalline form. The acids adhere with very different degrees of force to these bases; in general the attractions of the earths to the acids are greater than those of the metallic oxyds, and those of the alkalies greater than of the earths.

The names of the neutral salts are taken partly from the acid, and partly from the base; the generic name is derived from the acid, the specific from the base to which it is united. Thus, all the salts composed of the sulphuric acid, are arranged together under the name of Sulphats; and each species is named from the substance to which the acid is united, as the Sulphat of Potash, the Sulphat of Lime, &c.: And as each acidifiable base can be combined with different proportions of oxygen, so as to form acids of different qualities, the salts formed by these are distinguished by a variation in the termination of the generic name. Thus, the salts formed by the sulphureous acid are termed Sulphites. In this manner the nomenclature of all the compound salts is established.

It remains to notice the analysis of the VEGETABLE and ANIMAL PRODUCTS, important in a pharmaceutical point of view, as so many of them are employed in medicine. The Vegetable kingdom, in particular, furnishes by far the greater part of the articles of the *Materia Medica*.

Those substances which are the products of organization, are very different in their chemical characters from those belonging to the mineral kingdom.

The latter we can easily analyse. We can determine the number and proportions of their constituent principles with accuracy, and their analysis can often be confirmed by synthesis; in other words, we are able by artificial combination to form compounds possessed of the same chemical qualities as the bodies we have analysed. But with regard to the products of the vegetable and animal systems, the case is extremely different. If we are able to detect their component principles, we can scarcely determine their proportions; much less are we able to ascertain the mode in which they are combined. In no instance, therefore, does the analysis enable us to combine the principles, whether proximate or ultimate, which we have obtained, so as to form any compound at all resembling that which has been analysed. These productions, too, consist of a few principles, chiefly of carbon, hydrogen and oxygen, with the addition of azot and phosphorus in the animal kingdom; while the compounds belonging to the mineral kingdom are more varied in their composition.

The products of organization are likewise distinguished by susceptibility of decomposition. Their principles, having strong mutual attractions, are disposed to react on each other; and if this be favoured by humidity, or slight increase of temperature, new combinations are formed, whence the original compounds are destroyed.

In the analysis of these substances, it is necessary to mark an important distinction,—that between the proximate and ultimate principles of a compound. Two compounds may unite and form one substance; and this substance, by the means which analysis affords, may be resolved into the compound bodies of which it was imme-

diately formed, or into the simple principles of which they consist. The former are its Proximate, the latter its Ultimate Principles. The proximate principles of vegetable products are gum, resin, oil, &c.; their ultimate principles, are chiefly carbon, hydrogen and oxygen.

In subjecting any vegetable to analysis, the first object is to discover what are its proximate principles. For this purpose we subject it to the action of caloric, and of different chemical agents.

By the first, we separate those principles that are volatile, such as the essential oil. The application of this mean is, however, very limited, since an increase of temperature, not much exceeding that which is necessary to disengage any of their volatile principles, tends not merely to separate, but actually to decompose them. It is necessary, therefore, that the temperature should not exceed 212° of Fahrenheit's scale, which is obtained by heating these substances with water, when the volatile principles escape without any decomposition along with the aqueous vapour.

Of the different chemical agents useful in the vegetable analysis, water dissolves the gummy and extractive parts, the saline substances, and several other principles of inferior importance. Alcohol dissolves the resin, balsam, camphor, and essential oil. The substances which alcohol dissolves are separated by water; while the gum, which water holds in solution, is precipitated by alcohol. Ether dissolves the same principles as alcohol; it farther dissolves the elastic gum of some vegetables, and it precipitates the extractive matter from water. The alkalies discover several of the acids contained in vegetable substances, and the acids are sometimes used as tests.

Lastly, in the analysis of vegetables, we are often able to procure several of their proximate principles by mechanical means, particularly by expression. Sometimes, also, they exude spontaneously from the growing vegetable, or are obtained from it by incisions made in the branches or trunk.

After we have discovered the proximate principles of vegetables, the next step is to ascertain their composition.

This, with respect to their ultimate principles, is nearly uniform; the differences in their chemical properties and sensible qualities arising principally from differences in the proportions of these principles, and in the modes in which they are combined. These differences are too subtle to be very accurately determined by analysis, and hence this species of investigation is now acknowledged to convey no information on the medicinal powers of vegetables. Besides carbon, hydrogen and oxygen, which are their principal constituent parts; some of them contain azot and phosphorus, which modify their properties. Various metals, too, particularly iron and manganese, lime and the three alkalies, either pure, or in combination with some of the acids, are not unfrequently constituents of vegetable matter, though never in any considerable proportion, not is it certain but that some of these are formed during the analysis by which they are obtained.

The proximate principles of vegetables are sometimes analysed by mere exposure to heat; their elements enter into new combinations, and from the products we discover what the principles were, and even, to a certain extent, in what proportions they had been united. Sometimes the atmospheric air is admitted when they are raised to the temperature of ignition, and by collecting the substances formed by their combustion, we form a similar judgment as to their composition. Others of them are capable of undergoing fermentation; and from the products of this process, the constituent principles of the substance operated on are determined. Lastly, their analysis may often be effected by the agency of the nitric acid, which communicates to them oxygen, and by the resulting compound ascertains the nature of their acidifiable base.

The Proximate Principles of Vegetables are numerous, and of very different kinds. They are not all to be met with in every plant, or in every period of vegetation, but each of them is to be found in some plants, at certain periods of their growth.

They are all the products of vegetation from a common juice or sap, which circulates freely through every part

of the vegetable system, which is uniformly supplied by absorption, and which is perpetually changing its composition, according to the state of the plant. This sap being brought into contact, in the vessels of the vegetable, with the gaseous bodies absorbed by its leaves, is by the action of these vessels, assisted by the agency of light, changed in its composition, and thus the peculiar products of the vegetable are formed.

The first transition of the sap seems to be into **MUCILAGE** or **GUM**, as this is one of the proximate principles contained in the greatest quantity in vegetables, and which is abundant in young plants. It is an inodorous, insipid and glutinous substance, soluble in water in every proportion, and forming with it a viscid solution termed Mucilage. It is insoluble in alcohol, ether or oil, and is precipitated from its solution in water by the addition of alcohol, or any of the alkalies. It does not absorb oxygen from the atmosphere; it is neither fusible nor volatile. At a temperature superior to 212° , but inferior to that of ignition, it is decomposed, affording pyromucous or rather impure acetous acid, ammonia, carbonic acid and carbonated hydrogen gases, its residuum being charcoal containing lime. The principal products of its combustion are carbonic acid and water. By the action of nitric acid, it is converted into oxalic acid. The experiments of Mr. Cruickshank, prove it to be composed of oxygen, hydrogen, carbon, azot, and lime.

Gum is obtained by spontaneous exudation, by incisions made in the trunk of the growing vegetable, or by decoction of any vegetable containing it in water. No proper distinction exists between it and mucilage. As a medicine, it has little activity. From its chemical qualities it is of more importance; as its mixture, with the other vegetable principles, renders them more soluble in watery liquors, by which their action on the stomach is promoted. In pharmacy, it is employed to render oils, balsams, &c. miscible with water.

RESIN is another of these proximate principles, most abundantly diffused through the vegetable kingdom. It is often united with gum, but some vegetables exude

juices purely resinous. Resin is insoluble in water, is soluble in alkohol, ether, and oils; is not acted on by oxygen at any natural temperature, but burns when heated to ignition; is fusible at a temperature nearly that of boiling water, but incapable of being volatilized without being decomposed. The products of its decomposition by heat are, water, acetous acid, an empyreumatic oil, and a residuum of charcoal. Its constituent parts, therefore, are carbon, hydrogen and oxygen.

Resins are frequently odorous and sapid. They are more active than gums, with respect to their medicinal effects, the virtues of many of those vegetables which act most powerfully as medicines depending on their resinous part.

Gum and resin are often intimately mixed in vegetables, forming a gum-resin. Some of the most active articles of the *Materia Medica*, are natural compositions of this kind.

A proximate principle of vegetables, which, till lately, was always confounded with gum-resin, is that termed by the French chemists *EXTRACT* or *EXTRACTIVE MATTER*. The peculiar character by which it is distinguished from gum, resin, or any mixture of the two, is its being equally soluble in water and in alkohol; hence its solution in the one fluid is not precipitated by the addition of the other. The extractive principle also, when dissolved in water, and heated to 212° , in contact with the atmospheric air, absorbs oxygen with avidity, which neither gum nor resin does. By this absorption, it is converted into an insipid inert substance, no longer soluble in water. By the oxygenated muriatic acid, it is also changed into an insoluble concrete of a yellow colour. These properties seem sufficient to characterize it as a distinct principle; but there is still some obscurity respecting the mode of its existence in vegetable products. According to the French chemists, it is the principle upon which the virtues of many vegetable medicines depend, though it is difficult to obtain it unmixed with the other principles. By exposure to heat, it affords an empyreumatic acid and oil, and a small quantity of ammonia. Its elements, therefore, are carbon, hydrogen, azot, and oxygen.

OIL is a very common proximate principle of vegetable matter; it is of two kinds, Expressed, or Unctuous Oil, and Distilled, Volatile or Essential Oil. These have some common qualities, they are inflammable, insoluble in water, and unctuous to the touch; but they are also possessed of peculiar properties by which they are distinguished.

The first class, the Expressed, Fat, or Fixed Oils, are thick and unctuous, nearly insipid and inodorous; they congeal on exposure to cold, are insoluble in water or in alcohol; they combine with the alkalies, forming soaps; they are not volatilized at the temperature of 212° ; they are decomposed in close vessels, and burn when the atmospheric air is admitted, the products of the combustion being water and carbonic acid. At a natural temperature they slowly absorb oxygen, and by long exposure to the air they are thickened, and at length become concrete. They consist of carbon and hydrogen in the proportion nearly of 12 of the former to 3 of the latter.

Expressed oils are generally contained in the seeds and fruit of certain vegetables. They are extracted by expression or decoction with water, and are thus frequently in part impregnated with the extractive, mucilaginous, or resinous particles, whence in some instances they derive taste, odour, and even some medicinal virtues. In general, however, they are insipid, and are used in medicine principally for their lubricating quality; they are diffused in water by the medium of gum or sugar, or by the addition of a small quantity of any of the alkalies.

Volatile, Essential, or Distilled Oils, differ from the expressed oils in several of their properties. They are volatile at a low temperature, are entirely and quickly converted into vapour, at the heat of boiling water, without being decomposed; they are soluble in a small proportion in water, and are more abundantly soluble in alcohol; they do not combine with the alkalies with facility; they are more highly inflammable than the fixed oils, and, on exposure to the atmosphere, slowly absorb oxygen, are thickened, and are at length converted into substances of a resinous nature. In their composition, they contain more

hydrogen proportioned to their carbon than the fixed oils do.

The essential oils are in general highly odorous, pungent, and often even acrid; they exist in greatest quantity in the aromatic plants, and are usually obtained by distillation; the vegetable being heated to 212° along with water, and the oil being volatilized with the aqueous vapour. As medicines they possess a highly stimulating power.

In many vegetables there exists a natural combination of essential oil and resin, forming a fluid more or less thick and tenacious, usually also odorous and pungent, termed a *Balsam*. Balsams also contain a quantity of a peculiar vegetable acid, the Acid of Benzoin.

Another proximate principle of some vegetables, similar in many of its properties to the essential oils, is CAMPHOR. It is a solid tenacious concrete, of a white colour, semi-transparent, having a strong peculiar smell, and a penetrating taste. It is insoluble in water, but completely soluble in alcohol, ether, and oils; it evaporates at the common temperature of the atmosphere, and is volatilized in close vessels without decomposition. When its volatilization, however, is prevented, and heat applied, it is decomposed: a volatile oil, fragrant and pungent, of a rich yellow colour, amounting nearly to one-third of the weight of the camphor, distils over; a quantity of charcoal remains as a residuum, and hydro-carbonate, and carbonic acid gases escape with a portion of the peculiar acid termed Camphoric. Camphor, therefore, differs from the essential oils, in containing a larger proportion of carbon, and perhaps also of oxygen.

Camphor is found in distinct vesicles in the wood and bark of several vegetables; it is also contained in many essential oils. As a medicine, it possesses considerable powers.

The same relation which camphor has to the volatile oils, WAX seems to bear to the fixed oils. This substance is a product of vegetation. It is solid and tenacious, easily fusible, and inflammable. It does not combine with the alkalies; but, when melted, unites with expressed or

essential oils. It consists of carbon and hydrogen, in the proportion nearly of 13 of the former to 2 of the latter: some have supposed that it also contains a quantity of oxygen.

FECULA is a name appropriated to a dry, white, insipid powder, contained in many vegetables, particularly in the tuberosc roots and gramineous seeds. It is extracted by beating the dried root, wood, or seeds, with a large quantity of water; the fluid becomes milky, from the diffusion of a white powder through it. This, when dried, is the fecula, which, when not united with any of the other principles of the vegetable, is mild and insipid. It is insoluble in cold water, but with boiling water it forms a jelly. It is also insoluble in alcohol. It is an oxyd having carbon and hydrogen for its base. It is capable of being converted by certain processes into saccharine matter. By destructive distillation it affords a large quantity of acetous acid. The fecula is the most nutritious principle of plants, and is contained in great quantity in all vegetables used as food.

GLUTEN.—The farina of some vegetables is found to contain a viscous, elastic, and fibrous-like substance, which, from its close resemblance in properties to the animal product termed Gluten, has been named Vegetable Gluten. It is insipid, elastic, totally insoluble in water, and very sparingly soluble in alcohol. By the action of nitrous acid, it is converted into oxalic acid, and by exposure to heat in close vessels, it affords a large quantity of ammonia. Its analysis proves, that it contains more azot than any other vegetable principle.

ALBUMEN.—This is another principle of vegetables, which receives its name from its resemblance to a principle of animal matter. It is soluble in cold water, its solution being coagulated by heat or by alcohol; it is liable to putrefaction, and furnishes a large quantity of ammonia on exposure to heat. It abounds in the juices of several acrid and narcotic plants, and is also contained in the gramineous seeds.

SACCHARINE MATTER.—This exists in many vegetables, particularly in their fruits and roots, generally

united with their gum and extractive matter. When pure, its taste is sweet. It is soluble in water and in alcohol; is capable of crystallization. By fermentation, it is converted into alcohol, as this, by a second stage of fermentation, is changed into acetic acid. By the action of nitrous acid, it is converted into oxalic acid. By decomposition by heat, it affords more than half its weight of acetic acid; a small quantity of empyreumatic oil, carbonic acid, and hydrocarbonate gases, the residuum being charcoal. It consists of oxygen, carbon, and hydrogen.

ESSENTIAL SALTS.—The saline substances contained in vegetables have been termed their Essential Salts. They are either acids or neutral salts.

There are seven acids found native in vegetables; the Malic, Citric, Oxalic, Gallic, Tartarous, Acetic, and Benzoic. The first five consist of carbon and hydrogen, brought to the state of an acid by oxygen, and differ from each other chiefly in the proportion of hydrogen and carbon they contain.

The Oxalic Acid contains the largest proportion of oxygen; and it is into it that several of the other acids, and many of the vegetable oxyds, are converted by oxydation. It is very soluble in water, and crystallizable. It is distinguished by the very strong attraction which it has for lime, which it takes from every other acid. As it exists in vegetables, it is commonly united with potash, but so that the acid is present in excess.

The Malic Acid is contained in apples and in many other fruits before they are ripe. It does not crystallize; it contains more oxygen than the citric acid does, and is converted into the oxalic acid by the action of the nitrous acid.

The Citric Acid is soluble in water and crystallizable; it has a stronger attraction to the earths than to the alkalis; it is not, like the malic, convertible into oxalic acid.

The Tartarous Acid, as it exists in vegetables, is generally combined with potash, but in such a quantity as still to leave an excess of acid. From this salt the pure acid of tartar is obtained; it is very soluble in water, and

is crystallizable; it is convertible into oxalic acid; it is decomposed by heat, and affords more empyreumatic oil than any of the other acids; hence, it has been inferred, that it contains a larger proportion of hydrogen.

The Acetous Acid, though generally the product of fermentation, has been found in the sap of the vine, and in some other vegetables. It is decomposed in a high temperature, and along with the usual products of the decomposition of vegetable matter, it yields a small quantity of ammonia.

Benzoic Acid is contained in several balsams and gum resins: it is highly fragrant, and has a pungent acidulous taste; it is volatile and inflammable, is sparingly soluble in cold water; it is dissolved in considerable quantity by boiling water, and on cooling, crystallizes in white flakes.

The last of the native vegetable acids is the Gallic Acid, hitherto distinguished as the principle of astringency. It exists in gall-nuts, and in all those vegetables termed Astringents. It is extracted either by maceration with water or by sublimation. It is distinguished from every other acid by the strong attraction which it has for the oxyds of iron, and by forming with them a precipitate of a very deep black colour. It contains a very large quantity of carbon, combined with an inferior proportion of oxygen, and with a very small quantity of hydrogen.

A principle, which till lately was confounded with the gallic acid, is TANNIN, or the tanning principle. It is distinguished from every other principle by its power of combining with animal jelly, and forming a substance absolutely insoluble in water. It is contained in considerable quantity in the greater part of the vegetable astringents, and is generally mixed with the gallic acid.

Several of the native vegetable acids exist together in the same vegetable. They are never contained in distinct vesicles, but are either mixed with the mucilaginous or saccharine juice, or are combined with the alkalies or earths. Combinations of these acids with lime or potash, are, in particular, very abundant in the vegetable kingdom. Compounds formed by the union of the sulphuric,

nitric, muriatic, carbonic, and even phosphoric acids with the alkalies and earths, also exist in many vegetables.

The last of these proximate principles is the **LIGNEOUS** part, or woody fibre. It is the basis to which the others are attached, and composes the greater part of most vegetables, as it forms their entire structure. It is insipid and insoluble in water or alkohol, and consequently remains as the residuum, after the active principles of any vegetable have been extracted by the action of these solvents. By the action of the nitrous acid, it affords the malic and oxalic acids; by distillation it yields the pyroligneous acid. Its principal constituent part is carbon, combined with hydrogen and oxygen.

Besides those principles of vegetables which can be exhibited as distinct bodies, there are some of a more subtle kind, the existence of which has been maintained by many chemists; such as the **Aroma** or **Spiritous Rector**, the **colouring Principle**, the **Bitter Principle**, the **Narcotic Principle**, and several others. The existence of these, however, is very doubtful; the properties of smell, taste, colour, &c. being probably the result of peculiar variations in the composition of some of the known principles of vegetables, and not depending on any peculiar principle. The odour of vegetables, for instance, generally depends on their essential oil; and all the facts that have been stated in support of a distinct aroma, are explicable on the known volatility of these oils, or on the probability of part of them being dissolved by the atmospheric air.

After this enumeration of the proximate principles of vegetables, it may be proposed as a question of some importance, Whether they exist in the vegetable in a state of chemical combination, or whether they are merely mixed together?

The latter seems most probable. These principles can often be distinguished as existing separately from each other, and even as placed in separate cells; they can in many cases be separated by mechanical means; and even where they are more intimately mixed, that change of properties does not take place, which we must have ex-

pected were they chemically united, the virtues of each principle being discernible in the entire mixture, weakened, but not changed. It seems to follow, therefore, that the virtues of vegetable substances do not depend on chemical combinations of their proximate principles, but rather on the peculiar ultimate composition of one or other of these principles. Hence also it is evident, that in separating the proximate principles of any vegetable, we cannot expect to alter or improve its virtues, farther than in concentrating them by a separation from what is inert, or in separating principles which are possessed of different, or even opposite powers. The attainment even of these ends, however, is, in innumerable cases, of importance in their exhibition as medicines.

From this enumeration of the Proximate Principles of Vegetables, we may perceive the reasons for those pharmaceutical processes to which plants are usually subjected.

By Infusion in water, we impregnate the fluid with the gum, sugar, extract, tannin, saline substances, part of the essential oil, and part also of the resinous principle. The aroma of the plant is generally first taken up: by longer infusion the water is loaded with the colouring astringent and gummy parts: these are also most abundantly dissolved when the temperature is high. Hence an infusion differs according as the water has stood longer or shorter on the materials, and according as it has been promoted or not by heat. An infusion made in the cold is in general more grateful, while one made with heat, or by keeping the fluid long upon the materials, is more strongly impregnated with active matter.

By Decoction or boiling, the solvent power of the water is still farther increased; and hence the liquor always appears darker coloured, and is, in fact, more loaded with the principles of the vegetable which it can hold dissolved. The volatile parts, however, particularly the essential oil, are entirely dissipated; and therefore it is an improper process for those vegetables whose virtues depend, wholly or partially, on these parts. Even the fixed principles of vegetables, at least some of them, are injured by long decoction. The extractive matter, for instance, gradually

absorbs oxygen from the atmosphere, and is converted into a substance nearly insipid and inert. Opium, Peruvian bark, and many other vegetables, are injured in this manner by decoction, especially if the atmospheric air is freely admitted; and these two circumstances, the dissipation of the volatile matter, and the oxygenation of the extractive, considerably limit the application of this process. It is still used, however, with advantage, to extract the mucilaginous parts of vegetables, their bitterness, and several other of their peculiar qualities.

Alkohol may be applied to vegetables to extract those principles which are not soluble in water. It dissolves entirely their essential oil, camphor, and resin; and as these are often the parts on which the virtues of vegetables depend, these solutions, or Tinctures as they are termed, are often active preparations.

Equal parts of alkohol and water, in general, extract still more completely the active matter of plants, as we thus obtain a solution of all those substances which are separately soluble in either of these fluids.

When by the action of one or both of these fluids, we obtain a solution of the active principles of a vegetable, the solution may be evaporated to the consistence of a thick tenacious mass. This forms what is termed an Extract: it is termed an Aqueous Extract when obtained from the aqueous infusion or decoction of a plant, and Spiritous when alkohol has been the solvent. The design of this preparation is to obtain the active matter of the vegetable in a small bulk, and in such a state that it may be preserved a long time without suffering any alteration. It is evident, that it is a process which can be properly applied to such plants only as have their virtues dependent on some of their fixed principles, and even these are often injured by the heat employed, and the free access of the atmospheric air.

Distillation is another process applied to vegetable substances, by which we obtain some of their active principles, particularly their essential oil. If the vegetable matter be heated along with the water, the oil is volatilized, along with the aqueous vapour: it separates from the

water on being allowed to remain at rest; a part of it, however, is also dissolved, and communicates to the water a considerable degree of flavour, and often also of pungency. This forms what are termed Distilled Waters. If alkohol be used instead of water, the essential oil is completely dissolved in it, and we thus obtain what are termed Distilled Spirits.

By such processes we extract the active matter of vegetables from the inert matter with which it is more or less mixed, and are enabled to administer many remedies under a variety of forms, suited to particular circumstances. A single example will show the utility of investigations of this kind, respecting the component principles of vegetable products, and their relations to the more important chemical agents. Peruvian bark is one of the most important remedies in the *Materia Medica*. Practitioners have not always found it practicable to exhibit it in substance with advantage, as where the stomach is uncommonly irritable, or where, from the nature of the disease, it is necessary to give it in large doses, frequently repeated, it is apt to occasion sickness and other uneasy sensations, and even to be rejected by vomiting. Such inconveniencies are attempted to be obviated, by giving it in the different forms of infusion, decoction, tincture or extract, as any of these may best agree with the patient. Our knowledge of its constituent parts can only lead us to the proper application of these processes. From an accurate analysis of it, it has been proved that seven parts out of eight of it consist of woody fibre, or of a matter inert and insoluble, which cannot act on the system, and which affects the stomach only by its weight and insolubility. The remaining eighth part is that in which the activity of the medicine resides: it is therefore evident that if this be extracted, without injuring its activity, the medicine could be exhibited with much more advantage. This is in part accomplished by the preparations of it that have been mentioned; but even these do not convey it in all its force. If one ounce of the bark be infused or boiled in a certain quantity of water, the infusion or decoction is not nearly equal in efficacy to the

whole quantity of bark operated on. It is therefore evident that during either of these operations, the active matter of the bark has not been entirely extracted, or has suffered some change. And here chemistry lends her assistance, and still farther elucidates the peculiar nature of this substance, and the changes produced in it by these processes. It has been proved by experiments, that the matter on which the power of the bark depends, has a strong attraction for oxygen at a temperature moderately increased; that during the infusion, and particularly during the decoction of that drug, this active matter absorbs oxygen from the atmosphere, and is converted into a substance insipid, and inert. This leads to the improvement of the preparations of this medicine; and experiments instituted for the purpose have accordingly proved, that, while by long boiling the virtues of the bark are nearly totally destroyed, they are fully extracted by a few minutes decoction in covered vessels. The same investigations have pointed out the nature of the action of some other substances on bark, formerly not well understood. Thus, it has been found by experience, that the alkalies, and more particularly magnesia, enable water to extract the virtues of bark, more completely by infusion,—a circumstance elucidated by the fact since discovered, that the extractive matter of the bark, to which its activity is owing, combines with facility with these substances, and forms soluble compounds.*

Similar examples might be given of several other important vegetable remedies, which would sufficiently prove the utility to be derived from the analysis of the vegetable kingdom, and that indeed researches of this kind are absolutely necessary for the preparation of substances belonging to it as medicines.

It remains only to notice the Animal Analysis. But on this few observations need to be made; as there are comparatively but a small number of the articles of the *Materia Medica* which belong to the animal kingdom.

* *Annales de Chimie*, tom. ix. p. 19.

The animal products have the same general chemical characters as vegetables. They differ from them in being more liable to the process named Putrefaction; and in affording a large quantity of ammonia, when decomposed by heat. These differences depend principally on the presence of azot in a much larger proportion in the animal than in the vegetable products; which, during their decomposition, combines with the hydrogen they also contain, and furnishes the ammonia which is so abundantly discharged. Animal substances also contain sulphur and phosphorus; and in general a smaller proportion of carbon enters into their composition than into that of vegetables.

Notwithstanding these differences, there are many of the animal products which closely resemble the vegetable principles in their properties. The vegetable gluten and albumen are similar to the animal. The vegetable oils and butters resemble the animal fats. Gelatin has a resemblance to mucilage or fecula. A principle similar to the vegetable saccharine matter is found in milk. In some of the animal secretions, there are substances of a resinous nature; and the animal acids do not differ greatly from the vegetable compounds of the same class. Many of these substances, therefore, are acted on by chemical agents in a similar manner to vegetables, and, for medicinal purposes, are subjected to similar pharmaceutic processes.

PART II.

MATERIA MEDICA.

THE systems of classification of the articles of the Materia Medica, which are founded on their sensible qualities, their chemical compositions and properties, or their characters as objects of natural history, are extremely defective. They associate substances, which, as medicines, have little resemblance, and separate others which are intimately connected.

As the study of the Materia Medica is merely the study of the medicinal properties of certain substances, it is evident that the method of arranging them, as they agree in producing effects on the living system, is the one best calculated to fulfil all its objects.

The foundation of the classes being similarity of operation, those substances are arranged together which have the closest resemblance in medicinal power, and although, when the extremes of the classes are considered, substances may sometimes be found associated which appear to be little connected, yet this can never be so much so as in the other systems of classification, and the connexion, though apparently remote, may always by slight gradations be traced.

It is acknowledged, that the *Operations* of medicines, on which such a classification is to be formed, are often extremely obscure; yet where the association is established from a certain effect produced by the substances arranged together, and not from a mere opinion as to their

mode of operation, this obscurity is, at least in this point of view, of comparatively little importance, and distinctions may be established in general sufficiently precise.

In explaining the operations of medicines, and classing them according to these operations, it is to be regarded as a first principle, that they act only on the living body. The presence of life is accompanied with peculiar properties, and with modes of action, inexplicable on mere mechanical or chemical principles. Substances acting on the living system no doubt produce effects referable to these; but the changes they produce are also always so far modified as to be peculiar in themselves, and regulated by laws exclusively belonging to organized matter.

Medicines, in general, operate by stimulating the living fibre, or exciting it to motion. This proposition has even been stated as universal, and was received as an axiom, in a system superior, perhaps, to any, in conveying just and precise ideas on the nature of life, and the affections to which it is subject. Medicines, in common with all external agents, are, according to this system, incapable of directly altering the state of the vital power: they can only excite the parts possessed of that power to action; and however diversified their effects may appear to be, such diversities are to be referred merely to the different degrees of force in which they exert the general stimulant power they possess.

This proposition cannot, however, be received in an unlimited sense. From the exhibition of different medicines, very different effects are produced, which cannot be satisfactorily explained from the cause assigned,—the difference in the *degree* of stimulant operation. They differ in *kind* so far, that even in the greater number of cases, one remedy cannot by any management of dose or administration be made to produce the effects which result from the action of another.

It is therefore necessary to admit some modifications of the general principles above stated, and the following are perhaps sufficient to afford grounds for explaining the operations of remedies, and for establishing a classification of them sufficiently just and comprehensive.

I. Stimulants are not to be regarded as differing merely in the degree of stimulant operation which they exert. An important distinction exists between them, as they are more or less diffusible and permanent in their action. A stimulus is termed Diffusible, which, whenever it is applied, or at least in a very short time after, extends its action over the whole system, and quickly produces its full exciting effect. A diffusible stimulus is generally also transient in its action; in other words, the effect, though soon produced, quickly ceases. There are others, on the contrary, which, though equally powerful stimulants, are slow and permanent. These varieties, which are sufficiently established, serve to explain the differences in the powers of a number of the most important medicines; and they lay the foundation for the distinction of two great classes, Narcotics and Tonics, with their subordinate divisions of Antispasmodics and Astringents, both consisting of powerful stimulants; the one diffusible and transient, the other slow and permanent in their operation.

II. There is a difference between stimulants, in their actions being directed to particular parts. Some, when received into the stomach, quickly act upon the general system; others have their action confined to the stomach itself, or, at least, any farther stimulant effect they may occasion is slow and inconsiderable; while a third class consists of those which operate on one part, often without producing any sensible effect on the stomach or general system. Some thus act on the intestinal canal; others on the kidneys, bladder, vessels of the skin, and other parts; the affection they excite in these, being the consequence, not of any stimulant operation equally extended over every part, but of one more particularly determined. This difference in the action of stimuli is the principal foundation of the distinctions of medicines into particular classes. Cathartics, for instance, are those medicines, which, as stimuli, act peculiarly on the intestinal canal: Diuretics, those which act on the secreting vessels of the kidneys: Emmenagogues, those which act on the uterine system: Diaphoretics, those which exert a stimulant action on the vessels of the skin. With these operations, medicines, at

the same time, act more or less as general stimulants, by which each individual belonging to any class is thus rendered capable of producing peculiar effects; and many of them, by a peculiarity of constitution in the patient, or from the mode in which they are administered, frequently act on more than one part of the system, by which their effects are still farther diversified. Medicines, when thus determined to particular parts, are sometimes conveyed to these parts in the course of the circulation; more generally their action is extended from the stomach, or part to which they are applied, by the medium of the nervous system.

III. Medicines, besides acting as stimuli, sometimes occasion mechanical or chemical changes in the state of the fluids or solids, by which their action is more or less diversified. These operations of medicines were formerly supposed to be more extensive than they really are; and many absurd explanations were deduced from the supposed changes which the solids and fluids underwent in disease. Though these notions are now exploded, it must still be admitted that changes of this kind take place in the living system. Chemical changes in particular, there is reason to believe, very frequently modify the actions of remedies; and some very obvious operations of this kind, as well as others of a mechanical nature, serve as distinctions for establishing several particular classes.

These observations point out the principles on which the arrangement of the articles of the *Materia Medica*, from their medicinal operations, may be established.

Those stimulants, which exert a general action on the system, may first be considered. Of these there are two well marked subdivisions, the Diffusible and the Permanent; the former corresponding to the usual classes of Narcotics and Antispasmodics; the latter, including likewise two classes, Tonics and Astringents. In these there is a gradual transition passing into the one from the other, from the most diffusible and least durable stimulus, to the one most slow and permanent in its action.

The next general division is that comprizing local stimulants; such are the classes of Emetics, Cathartics,

Emmenagogues, Diuretics, Diaphoretics, Expectorants, Sialagogues, Errhines, and Epispastics. These all occasion evacuation of one kind or another, and their effects are in general to be ascribed, not to any operation exerted on the whole system, but to changes of action induced in particular parts.

After these, those few medicines may be considered whose action is merely mechanical or chemical. To the former belong Diluents, Demulcents and Emollients. Anthelmintics may perhaps be referred with propriety to the same division. To the latter, or those which act chemically, belong Antacids or Absorbents, Lithontriptics, Escharotics, and perhaps Refrigerants.

Under these classes may be comprehended all those substances capable of producing salutary changes in the human system. Several classes are indeed excluded which have sometimes been admitted; but these have been rejected, either as not being sufficiently precise or comprehensive, or as being established only on erroneous theory.

The subdivisions of these classes may sometimes be established on the natural affinities existing among the substances arranged under each; on their chemical composition; their resemblance in sensible qualities; or, lastly, on distinctions in their medicinal virtues, more minute than those which form the characters of the class. In different classes one of these methods will frequently be found preferable to any of the others.

TABLE OF CLASSIFICATION.

A. GENERAL STIMULANTS.

- | | | |
|----------------|---|-----------------|
| a. Diffusible. | { | Narcotics. |
| | | Antispasmodics. |
| b. Permanent. | { | Tonics. |
| | | Astringents. |

B. LOCAL STIMULANTS.

Emetics.
 Cathartics.
 Emmenagogues.
 Diuretics.
 Diaphoretics.
 Expectorants.
 Sialagogues.
 Errhines.
 Epispastics.

C. CHEMICAL REMEDIES.

Refrigerants.
 Antacids.
 Lithontriptics.
 Escharotics.

D. MECHANICAL REMEDIES.

Anthelmintics.
 Demulcents.
 Diluents.
 Emollients.

CLASS I.—NARCOTICS.

THE first division of the preceding classification, is that comprehending those stimulants, the action of which is general over the system. The first class of this division comprizes those which are highly diffusible, and at the same time transient in their operation. This corresponds with the common class of Narcotics or Sedatives, usually defined, Such substances as diminish the actions and powers of the system, without occasioning any sensible evacuation. The definition is imperfect, as it does

not include that stimulant operation which it is acknowledged they equally produce.

When given in a moderate dose, Narcotics excite the functions both of body and mind: the force and frequency of the pulse are increased, muscular action is more vigorous, and hilarity or intoxication are induced. These symptoms, after continuing for some time, are succeeded by those of diminished action: the pulse becomes slower, is full and soft, the body is less sensible to impressions, and less capable of voluntary exertion, and the mind is inactive. This state terminates in sleep. When it ceases, there remains a degree of general debility, marked by sickness, tremor and oppression. By a large dose, debility, without previous excitement, is occasioned, and the consequences of an immoderate quantity are delirium, paralysis, coma, and convulsions, sometimes terminating in death. These are the general effects, considerably diversified, however, as arising from different narcotics, and varied by other circumstances. Habitual use considerably diminishes their power.

These medicines act primarily on the stomach, whence their action is conveyed by nervous communication to the general system. Externally applied, they exert their usual action, though with less force. Directly applied to the muscles of animals, they first stimulate them to contraction, but ultimately exhaust their irritability.

As the medicines belonging to this class diminish the actions of the system, when given even in small doses, their primary operation was generally considered as of a depressing kind; and the stimulant effects which occasionally appeared to be produced by their exhibition, were ascribed to what was termed the reaction of the system, or the exertion of that salutary power supposed to belong to the living body, by which every noxious application is resisted and thrown off. They were therefore considered as *directly* sedative, and *indirectly* stimulant.

Precisely the reverse of this doctrine was likewise advanced. As their exciting effects were those which appeared first, and were succeeded by those of debility, and as the first were produced from a small dose, while the

others were occasioned when the dose was comparatively large, these substances were regarded as direct stimulants, capable of exciting the actions of the system; and the symptoms of debility which they so frequently produced, were considered as arising from that exhaustion of power, which, according to a general law of the system, always follows increased action suddenly raised and not kept up. They were regarded, therefore, as *directly* stimulant, and *indirectly* sedative, and the peculiarities of their action were ascribed to their rapid and transient stimulant operation.

If, in investigating this subject, we merely contrast these two theories, little doubt can remain of the superiority of the latter. The suppositions of there being a power in the living system, fitted to resist any noxious agent, and of such a power acting before the deleterious effects have taken place, and thus retarding or preventing their production, are improbable, and unsupported by any satisfactory proof. Since the stimulant operation of Narcotics always precedes the symptoms of languor and debility which they produce; it is the direct conclusion, that these latter are the consequences of the former. The analogy between Narcotics and other substances, admitted to be stimulants, but which are less rapid in their operation, is also in many respects so direct, as to prove similarity of action. And their utility in several diseases, in which they are employed as stimulants, is scarcely consistent with the opinion, that they possess a real depressing power. Some doubt, however, is still attached to the theory that they are direct stimulants, from the fact, undoubtedly true, that the sedative effects of Narcotics are frequently disproportioned to their previous stimulant operation, allowing even in such cases, for its rapidity and little permanence; and the proposition, though apparently somewhat paradoxical, is perhaps just, that these substances are at once capable of stimulating the living fibre, and, independent of that stimulant operation, exhaust to a greater or less extent, by *direct* operation, the living power. The effects of certain chemical agents on the living system, as lately ascertained, appear to support some conclusion of this kind.

Narcotics being capable of producing either stimulant or sedative effects, may be practically employed with very different intentions. Either operation is obtained chiefly by certain modes of administration. If given in small doses, frequently repeated, the actions of the system are excited, and kept up. But if given in larger doses, at distant intervals, the state of diminished action and lessened sensibility is obtained. As stimulants, they are employed in various diseases of debility; in intermittent fever, and continued fevers of the typhoid type; in gout, hysteria, &c. As sedatives, they are used to allay pain and irritation, to procure sleep, and diminish secretions; hence their applications in spasmodic and painful diseases, in hæmorrhagies and increased discharges. In an inflammatory state of the system, the use of some of them is not altogether without danger from their stimulating effects.

NARCOTICS.

ALCOHOL.

ETHER.

CAMPHOR.

PAPAVER SOMNIFERUM.

HYOSCYAMUS NIGER.

ATROPA BELLADONA.

ACONITUM NAPELLUS.

CONIUM MACULATUM.

DIGITALIS PURPUREA.

NICOTIANA TABACUM.

LACTUCA VIROSA.

DATURA STRAMONIUM.

RHODODENDRON CHRYSANTHUM.

RHUS TOXICODENDRON.

ARNICA MONTANA.

STRYCHNOS NUX VOMICA.

PRUNUS LAURO-CERASUS.

ALCOHOL. Ardent Spirit. Spirit of Wine.

THIS fluid is formed, by the process of fermentation, from sweet vegetable juices, or solutions of saccharine matter in water. During the fermentation, the saccharine matter suffers decomposition. Part of its oxygen combines with part of its carbon, and forms carbonic acid, which is disengaged; the remaining carbon and oxygen unite with the hydrogen of the sugar, and form the alcohol, which is the only other product of the fermentation.

The alcohol thus formed remains diluted with much water, and combined with saccharine and extractive matter, constituting the vinous or fermented liquors, which, from variations of composition, differ from each other in several of their qualities, but which agree in the possession of certain properties, depending on the quantity of alcohol they contain.

From these liquors the alcohol is obtained by distillation. It passes over diluted with water, and impregnated with an oily matter derived from the fermented liquor. In this manner the different spiritous liquors of commerce are formed. From these the alcohol may be obtained pure by repeated distillations. When malt spirit is used, the rectification of the alcohol is facilitated, by adding to the spirit, previous to its distillation, one-sixteenth of its weight of dried sub-carbonat of potash, and again distilling it with the addition of a small quantity of alum.

Alcohol, obtained by such a process, is a colourless transparent fluid, fragrant and pungent: its specific gravity, when pure, is 8200 in its usual state; when its specific gravity is 8350, it contains 5 of water in the 100. It is highly volatile and inflammable, and yields, by its combustion, water and carbonic acid. It combines with water in every proportion, and is the proper solvent of resin, balsam, camphor, and essential oil.

Alcohol is a powerful diffusible stimulus: its stimulant power being greater or more permanent, proportioned to its sedative quality, than perhaps any of the other Narcotics. In a moderate dose, it produces a state of high ex-

citement both of body and mind, which is followed by proportional languor: in a larger dose, it occasions more violent effects,—intoxication, delirium, stupor, coma, and death.

Alkohol is scarcely employed in medicine in its pure state, but extensively under the form of vinous and spiritous liquors. These afford our most powerful stimulants. Wines seem more permanent in their stimulant operations than ardent spirits; hence they are superior in tonic power, though inferior in producing a sudden stimulus.

Both are used with advantage in many diseases of debility, especially those of the febrile kind, the general rules being observed in their exhibition which have been already noticed under Narcotics in general. From its comparatively strong and permanent stimulant operation, alkohol cannot be employed as an anodyne.

From the long-continued use of alkohol, many diseases derive their origin, as dyspepsia, hypochondriasis, and visceral obstructions occasioning dropsy. These may be ascribed to the exertion of its stimulant power, by which the irritability of the stomach and other viscera is worn out, and indirect debility produced.

Alkohol is used externally as a stimulant in muscular pains: it is one of the best applications to burns; and it is used with advantage to restrain hæmorrhage.

In pharmacy, it is employed as the solvent of the active matter of many vegetable, and some animal productions. Diluted with an equal weight of water, it forms Proof Spirit, (*alkohol dilutum*), which is also extensively used as a menstruum.

ETHER. *Ether.*

THIS substance is the product of the action of acids upon alkohol; it differs from alkohol principally in containing more hydrogen, though the different ethers, as produced by the different acids, vary in their composition and properties. They are the lightest and most volatile of all known fluids, and are highly inflammable; their smell is fragrant, and taste pungent.

In their medicinal powers, the ethers resemble alcohol; but they are rather less permanent in their action. They are used principally to alleviate or remove spasmodic action, and hence are exhibited with much advantage in asthma, hysteria and other spasmodic diseases. Sulphuric ether, or that obtained from the action of sulphuric acid on alcohol, is principally used; its dose is from half a drachm to one drachm; and as its operation is sudden and transient, it requires to be frequently repeated. Externally applied, it relieves spasmodic contractions of the muscles, and is used as an application to burns.

CAMPHORA. Camphor. *Laurus Camphora*, Lin. *Cl. Enneandria. Ord. Monogynia. Nat. Ord. Oleraceæ. Habitat, Japan, India.*

CAMPHOR is a proximate principle of vegetables, contained in many plants, especially those of the aromatic kind. For the purposes of commerce, it is obtained from a species of laurel, the *Laurus Camphora*, a native of Japan. It exists in distinct grains in the wood of the root and branches of this tree. It is extracted by sublimation; in Europe, it is purified by a second sublimation, with the addition of one-twentieth of its weight of lime.

Pure camphor is colourless, semi-transparent, tenacious, and somewhat unctuous to the touch; its smell is strong and fragrant; its taste pungent and bitter. It is volatile at every natural temperature; is fusible in a heat inferior to 212° ; is inflammable; scarcely soluble in water, but entirely soluble in alcohol, ether, and oils, essential or expressed. It consists of carbon and hydrogen, and differs from the essential oils, in containing a larger proportion of carbon, with some oxygen. By combustion, it affords carbonic and camphoric acids.

In a moderate dose, camphor produces effects similar to those of other narcotics. Its stimulant operation, however, is not considerable, even in a small dose; and in a large dose it always diminishes the force of the circulation; induces sleep, and sometimes causes delirium, vertigo and convulsions, ending in total insensibility.

As a stimulant, camphor has been used in typhus, cynanche maligna, confluent small-pox, and other febrile affections accompanied with debility, in retrocedent gout, and to check the progress of gangrene. As a sedative, it is used in affections of an opposite nature, as in pneumonia, rheumatism, and gonorrhœa, combined with nitre or antimonials, or by itself, where evacuations have been made. In mania, it has sometimes succeeded as an anodyne: as an antispasmodic, it has been employed with advantage in asthma, chorea, and epilepsy.

The dose of camphor is from 5 to 20 grains. It cannot be given with safety in a larger dose than half a drachm; and Dr. Cullen has likewise remarked, that in too small a dose, as that of a few grains, it has very little effect. In divided doses, it may be given to the extent of a drachm or more in the day. Its power of checking the progress of gangrene is promoted by combination with musk, or carbonat of ammonia: combined with opium, it forms a powerful diaphoretic; and its efficacy in inflammatory diseases is augmented by antimonials.

Camphor ought generally to be given in a state of mixture in some fluid form, as being then less apt to excite nausea. It may be diffused in water by trituration with sugar, mucilage, or almonds. To reduce it previously to powder, a few drops of alcohol must be added. Magnesia, by being triturated with it, has the effect of dividing and rendering it smooth, and may be used for its suspension; a number of the gum-resins also act on it in such a manner, that, from their mixture, a soft uniform mass is formed, and this affords another mode of diffusing it in water.

Externally applied, camphor is used as an anodyne in rheumatism and muscular pains, and as a discutient in bruises and inflammatory affections; it is dissolved in alcohol or expressed oil, and applied by friction to the part. Added to collyria, or mixed with lard, it is of service in ophthalmia. Suspended in oil, it is used as an injection in ardor urinæ, and as an enema to relieve the uneasy sensations occasioned by ascarides. The combination of it with opium is useful as a local application in toothach.

OFFICINAL PREPARATIONS.—Acid: Acetos: Camph. Emuls: Camph. Ol: Camph. Tinct: Camph. *Ed.*—Mist: Camph. Lin: Camph: Comp. Tinct: Opii Camph. *Lond.*

PAPAVER SOMNIFERUM. Poppy. *Polyand. Monogyn. Rhæad. Capsula et Succus spissat. Europe, Asia.*

THE capsule of this plant, by incision through its cortical part, affords a milky juice, which, by exposure to the sun and air, becomes concrete, and of a brown colour. This is termed Opium, and is the production of the plant that is chiefly medicinally employed. The leaves and stalks are inferior in narcotic power; the seeds are inert.

Opium is soft and tenacious, of a dark red or brown colour, having a strong fœtid odour, and a nauseous acrid taste; it burns with a bright flame. It is usually imported from Egypt, Turkey and the East Indies. Its composition is not perhaps well ascertained. It is supposed to consist principally of gum and resin, in the proportions of about four and a half of each in twelve parts of the crude opium. The bitterness is said to reside in the gum; the astringency, flavour, and narcotic quality, in the resin. It affords a volatile principle; water distilled from it having its nauseous taste and smell, but none of its narcotic quality. It contains also some saline matter, and a substance insoluble either in alcohol or water.

From its analysis may be estimated the effects of different solvents upon it. Alcohol, and proof spirit dissolving its resin, afford tinctures possessing all its virtues. Water dissolves its gummy part, which is much less active, but a part of the resin is at the same time taken up by the medium of the gum. Wines also afford solutions possessing the virtues of opium. Vinegar dissolves its active matter, but greatly impairs its power.

Opium was once supposed to act exclusively on the blood; but numerous facts and experiments have shewn, that its action is on the living solids, and that that action is propagated and diffused by the medium of the nervous system.

As to the nature of that action, its effects prove it to be a direct and highly diffusible stimulant. In a moderate dose, it increases the frequency, force, and fulness of the pulse; augments the temperature, and gives vigour to every function of the body and mind, occasioning often intoxication and delirium. These are succeeded by diminution of the force and frequency of the pulse, by lassitude, impaired sensibility and sleep. The first symptoms are merely those of increased action from the stimulant power of the opium; those that succeed are considered as the consequences of this. It must be allowed, however, that they are disproportioned to the preceding excitement, or to an equal or greater excitement produced by other stimulants, as by alcohol; and hence arises the superiority of opium as an anodyne and sedative. This has been ascribed to the greater diffusibility of its operation, in which it has been proved by direct experiments to surpass every other stimulant, but which is perhaps scarcely adequate to explain its peculiar effects.

If a larger dose of opium be given, the symptoms of diminished action appear without any previous excitement, and are even followed by delirium, stupor, deep and difficult breathing, convulsions and death.

From its topical application, similar effects are produced: at first, increase of pain, augmented muscular contraction, increased heat, and even inflammation, which are more or less quickly succeeded by a greater insensibility to impressions, and a greater difficulty of being excited to contraction by the application of other stimuli. The latter symptoms are also immediately induced by the application of a large dose. These phenomena, it is obvious, admit of a similar explanation.

The action of opium on the system in a diseased state is precisely similar. In typhus and other diseases of debility, its exhibition in a moderate dose produces all the salutary effects resulting from the administration of wine and other powerful stimulants, while in diseases of an opposite type, where there is already increased action, it is not less prejudicial.

After thus considering the action of opium, it may be

observed with respect to it, (and the observation extends to narcotics in general), that whether it be considered as a powerful stimulant, as a direct sedative, or as possessing both powers, the practical application of it is nearly the same; since all admit that it may be exhibited so as to obtain from it stimulant and also debilitating effects, and that the former are primary effects, and are obtained from it in a moderate dose, while the latter are secondary, and are only produced by a larger dose. Although, therefore, the explanation of the mode of operation be different, there is no dispute as to the operation itself, or the effects it produces.

The principal indications which opium is capable of fulfilling, are, supporting the actions of the system, allaying pain and irritation, relieving spasmodic action, inducing sleep, and checking morbidly increased secretions. It is differently administered, as it is designed to fulfil one or other of these indications.

Where opium is given as a stimulus, it ought to be administered in small doses, frequently repeated, and slowly increased, as by this mode the excitement it produces is best kept up. But where the design is to mitigate pain or irritation, or the symptoms arising from these, it ought to be given in a full dose, and at distant intervals, by which the state of diminished power and sensibility is most completely induced.

One other general rule with respect to the administration of opium, is, that it ought not to be given in any pure inflammatory affection, at least till evacuations have been used, or unless means are employed to determine it to the surface, and produce diaphoresis.

In continued fevers, not of the pure inflammatory kind, opium is administered sometimes as a general stimulus, and at other times to allay irritation. The great practical rule in such cases is, that it ought to be given in such quantities only, that the pulse becomes slower and fuller from its operation. Its exhibition is improper where local inflammation, especially of the brain or of its membranes, exists.

In intermittent fever, the exhibition of an opiate renders the paroxysm milder, and facilitates the cure.

In the greater number of the Profluvia, catarrh, diarrhoea, cholera, opium is employed to lessen the discharge, and is frequently the principal remedy in effecting the cure. In passive hæmorrhagy, it proves useful by its stimulant power. In retrocedent gout it is used as a powerful stimulant.

In convulsive and spasmodic diseases, it is advantageously administered, with the view of relieving symptoms, or even of effecting a permanent cure, and in several of them it requires to be given to a very great extent.

In lues venerea it promotes the action of mercury, and relieves the irritation arising either from that remedy, or from the disease.

It is often given to promote healthy suppuration, and is a principal remedy in arresting the progress of gangrene.

Externally applied, opium alleviates pain, and relieves spasmodic action. Hence the utility of it in colic, in tetanus, in toothach, &c. In the form of enema, it is of singular efficacy in tenesmus, and it is applied under the same form in other diseases, where its administration by the mouth is inconvenient or impracticable.

The watery solution of it is used as an application in various superficial inflammations.

The usual dose of opium is one grain. Where it has been habitually used, a larger quantity is necessary; and in several diseases, as mania, hydrophobia, or tetanus, it also requires to be given in much larger doses.

Where opium has been taken in such quantities as to produce dangerous consequences, the contents of the stomach are first to be evacuated by a powerful emetic, as a solution of sulphat of zinc. Large draughts of vinegar, or any of the native vegetable acids, are then to be swallowed, which seem to operate by affording oxygen to the stomach. Moderate doses of brandy, or a strong infusion of coffee, have also been found useful.

Offic. Prep.—Elect: Opiat. Pil: Opiat. Pulv: Opiat. Pulv: Ipecac: cum opio. Tinctura Opii. Tinct: Opii Ammoniatæ. Tinct: Saponis cum opio. Troch: Glycirrhiz:

cum opio. *Ed.*—Opium Purific. Tinct: Opii Camph. *Lond.*—Extr: Opii. Syrup: Opii. *Dub.*

THE dried capsule of the poppy is sometimes employed in preference to opium itself. Its active matter is extracted by decoction with water, and this made into a syrup, by boiling with sugar, is used as an anodyne. It is a weak preparation, and is in general only given to children. The dose to a child a year old is one drachm. A syrup made from opium is to be preferred, as the dose can be regulated with much more certainty. An infusion of the capsules is used as an anodyne fomentation.

Offic. Prep.—Extr: Papav: alb. Syr: Papav: somnif. *Ed.*

HYOSCYAMUS NIGER. Black Henbane. *Pentand. Monog. Solanac. Herba, Semen. Indigenous.*

THE leaves of this plant, when recent, have a slightly foetid smell, and a mucilaginous taste; when dried, they lose both taste and smell, and part also of their narcotic power. The root possesses the same qualities as the leaves, and even in a more eminent degree.

Henbane resembles opium in its action more than any other narcotic does. In a moderate dose, it increases at first the strength of the pulse, and occasions some sense of heat, which are followed by diminished sensibility and motion; in some cases by thirst, sickness, stupor, and dimness of vision. In a larger quantity, it occasions profound sleep, hard pulse, and sometimes fierce delirium, ending in coma or convulsions, with a remarkable dilatation of the pupil, distortion of the countenance, a weak tremulous pulse, and eruption of petechiæ. On dissection, gangrenous spots have been found on the internal surface of the stomach. Its baneful effects are best counteracted by a powerful emetic, and by drinking largely of the vegetable acids.

Henbane has been used in various spasmodic and painful diseases, as in epilepsy, hysteria, palpitation, headach, paralysis, mania and scirrhus. It is given in the form of

the inspissated juice of the fresh leaves, the dose of which is from one to two grains, which requires to be gradually increased. It is sometimes employed as a substitute for opium, where the latter, from idiosyncrasy, occasions any disagreeable symptom. The henbane also is free from the constipating quality of the opium.

Offic. Prep.—Succ: piss: Hyosc: N. Tinct: Hyosc: N. *Ed.*

ATROPA BELLADONNA. Deadly Nightshade. *Pentand. Monogyn. Solanaceæ. Folia. Indigenous.*

THE leaves have scarcely any smell, and only a slightly nauseous, sub-acrid taste. The berries are sweetish. Both are narcotic, as is also the root. In a moderate dose, belladonna occasions a sense of warmth, followed by diaphoresis, and a disposition to sleep, frequently with sickness and vertigo; in a large dose, symptoms of intoxication, intolerable thirst, dilatation of the pupils, low and feeble pulse, convulsions and paralysis. On dissection, the stomach and intestines are found inflamed.

Belladonna was first employed as an external application, in the form of fomentation, to scirrhus and cancer. It was afterwards administered internally in the same affections; in cases of extensive ulceration, in paralysis, chronic rheumatism, amaurosis, and various diseases of the nervous kind. Its effects, however, have been so seldom permanently beneficial, that it is now rarely used. Its dose is from one to three grains of the powdered dried leaves, or one grain of the inspissated juice.

Offic. Prep.—Succ: Spiss: Atrop: Bellad. *Ed.*

ACONITUM NAPELLUS. Aconite, Monk's-hood, or Wolfsbane. *Polyand. Trigyn. Multisiliquæ. Herba. Europe, America.*

THE smell of the leaves of aconite, when recent, is narcotic, but is lost by drying: Their taste is sub-acrid. In a moderate dose its effects are those of a narcotic, with slight diaphoresis; in a larger dose it occasions vertigo, syncope, and convulsions.

Aconite was employed by Störck in obstinate chronic rheumatism, exostosis, paralysis, ulceration, and scirrhus. By other practitioners, it has more particularly been found useful in the first of these diseases. Its dose is from one to two grains of the powdered dried leaves; of the inspissated juice half a grain.

Offic. Prep.—Succ: Spiss: Aconit: Napell. *Ed.*

CONIUM MACULATUM. Cicuta. Hemlock. *Pentand.*
Digyn. Umbellatæ. Folia. Semen. Indigenous.

THE stalk of hemlock is large and spotted; the leaves are of a dark-green colour, have a faint disagreeable smell, and a nauseous herbaceous taste. The seeds are inferior in strength.

Hemlock is a very powerful narcotic. In a very moderate dose it is apt to occasion sickness and vertigo; in a larger quantity it induces anxiety, dilatation of the pupils, delirium, stupor, and convulsions.

The free internal use of this plant was introduced by Störck. He recommended it particularly in scirrhus and in cancerous sores, in which it received a very extensive trial. While its inefficacy towards effecting a radical cure is established, its utility as a palliative is admitted. It has likewise been found serviceable in scrofulous and venereal ulcerations, glandular tumors, chronic rheumatism, and several other diseases. The dose is two or three grains of the powdered leaves, or one or two grains of the inspissated juice. It requires to be increased, in general, to a very considerable extent: at the same time, this must be done with caution, as both the dried leaves and inspissated juice are variable in their strength. The dried leaves are less liable to injury from keeping than the inspissated juice. The drying should be performed quickly before a fire, and the powder should be kept in phials closely stopped and secluded from the light. The proof of the drying having been properly performed is the powder retaining the odour of the leaves, and the deepness and freshness of their colour.

Offic. Prep.—Succ: spiss: Conii Macul. *Ed.*

DIGITALIS PURPUREA. Foxglove. *Didynam.* *Angiosperm.* *Solanac.* *Folia.* *Indigenous.*

THE leaves of digitalis have a bitter taste, with scarcely any odour. When properly dried, their colour is a lively green. They ought to be collected when the plant begins to blossom, to be dried quickly before a fire, and preserved unpowdered.

Of all the narcotics, digitalis is that which diminishes most powerfully the actions of the system; and it does so without occasioning any previous excitement. Even in the most moderate dose it diminishes the force and frequency of the pulse, and in a large dose reduces it to a great extent, as from seventy beats to forty or thirty-five in a minute, occasioning, at the same time, vertigo, indistinct vision, violent and durable sickness, with vomiting. In a still larger quantity it induces convulsions, coldness of the body, and insensibility, symptoms which have sometimes terminated fatally. Besides its narcotic effects, digitalis acts peculiarly on the absorbent system: by increasing absorption, it proves a powerful diuretic.

As a narcotic, foxglove has been recommended in epilepsy, insanity, and in some acute inflammatory diseases. Lately, it has been very extensively employed in phthisis, and the beneficial effects which it produces in that disease are probably owing to its narcotic power, by which it reduces the force of the circulation through the lungs and general system. It is administered so as to produce this effect. One grain of the powdered leaves, or ten drops of the saturated tincture, may be given night and morning. This dose is increased one-half every second day, till its action on the system becomes apparent. As soon as the pulse begins to be diminished, the increase of dose must be made with more caution; and whenever nausea is induced, it ought rather to be reduced, or if necessary, intermitted for a short time. If the sickness become urgent, it is best relieved by stimulants, particularly small doses of brandy with aromatics. The tincture has been supposed to be the best form of administering digitalis, when the remedy is designed to act as a

narcotic: it is also more manageable in its dose, and more uniform in its strength, than the dried leaves.

The use of digitalis as a diuretic is to be afterwards noticed.

Offic. Prep.—Inf: Digit: P. T: Digit: P. *Ed.*

NICOTIANA TABACUM. Tobacco. *Pentand. Monogyn.*
Solanac. Folia. America.

THE taste of tobacco is extremely bitter and acrid; its smell is fœtid and narcotic. It burns with a sparkling flame, from a quantity of nitrat of potash which it contains. Its active matter is dissolved both by water and alkohol; by decoction its powers are much impaired.

The effects of tobacco are those of a powerful narcotic. Along with severe nausea and vomiting, it reduces the force of the circulation, and occasions extreme muscular debility, with insensibility and cold sweats. It has likewise some power as a diuretic, probably from promoting absorption.

As a diffusible stimulant, the smoke of tobacco thrown into the intestines, was at one time employed in the recovery of drowned persons, a practice now exploded as pernicious. It is employed with more advantage in ileus and incarcerated hernia, though it requires to be managed with much caution. The watery infusion, of the strength of two drachms of the tobacco to one pound of water, is a more convenient mode of exhibiting it, as an enema. The smoke received into the mouth relieves the pain of toothach by its narcotic power, or by exciting a profuse salivary discharge.

Off. Prep.—Vin: Nicot: T. *Ed.*

LACTUCA VIROSA. Strong-scented Lettuce. *Syngenes.*
Polygam. æqual. Compositæ. Folia. Indigenious.

THE leaves of this plant have a strong fœtid smell, similar to opium, and yield a white juice, in which their activity resides. Their taste is bitter and acrid. It possesses a narcotic power, but has been used principally as

a diuretic in dropsy, in the form of the inspissated juice. The dose is five or ten grains, which is gradually increased to one or two drachms in twenty-four hours: It has been recommended also in palpitation, and in intermittent fever.

Off. Prep.—Succ: Spiss: Lact: Vir. *Ed.*

DATURA STRAMONIUM. Thorn-Apple. *Pentand. Monog. Solanac. Herba. Indigenous.*

THE leaves have a narcotic odour, and a bitter taste. They possess all the powers of a narcotic, and have been recommended in convulsive diseases, especially in epilepsy. They have been used also in mania. The usual form in which stramonium has been given, is that of the inspissated expressed juice of the leaves. Dose from one to three grains twice a-day.

ARNICA MONTANA. Leopards-Bane. *Syngenes. Polygam. superf. Compositæ. Flores, Radix. Germany.*

THE flowers have a smell slightly fœtid, and a penetrating bitter taste. Along with narcotic effects, they excite vomiting and catharsis. They have been used in amaurosis, paralysis, convulsive disorders, gout, and rheumatism. Dose, five grains in substance dried, or one drachm in infusion.

The root of arnica is aromatic and tonic, and has been used as a substitute for Peruvian bark.

RHODODENDRON CHRYSANTHUM. Yellow flowered Rhododendron. *Decand. Monogyn. Bicornes. Folia. Siberia.*

THE leaves of this plant are destitute of smell, but have a bitter, rough and sub-acrid taste, which they communicate to water by infusion or decoction. They are narcotic, producing in a large dose intoxication and delirium. It has been given as a remedy in chronic rheumatism and gout; it frequently excites a sensation of

creeping in the skin, and diaphoresis. The form in which it is given is decoction, two drachms being boiled in ten ounces of water, one or two ounces of the strained liquor being given twice a-day, and gradually increased.

RHUS TOXICODENDRON. Poison Oak. *Pentand. Trigyn. Dumosæ. Folia. North America.*

THIS plant has so much acrimony, that the touching of the leaves, or rubbing them on the skin, occasions itching, inflammation, and desquamation; taken internally, it excites nausea, vertigo, and pain in the head. The dried leaves have been used in paralysis, in some cases with marked advantage. The dose is half a grain twice or thrice a-day in the form of bolus, and gradually increased to three or four grains daily. It excites a sense of heat, and irregular motions in the parts affected.

STRYCHNOS NUX VOMICA. Vomica Nut. *Pentand. Monogyn. Solanaceæ. East Indies.*

THE taste of this kernel is extremely bitter; it has little or no smell, and is so hard that it cannot be reduced into powder by beating.

This nut is a very powerful narcotic, inducing even death by its sedative power, as, on dissection, no marks of inflammation, or local affection, are to be discovered in the stomach.

As a narcotic, it has scarcely been used, though it has been recommended in mania, epilepsy, hysteria, &c. It has been given in dysentery and intermittent fever, in a dose of five grains twice a-day, but it does not possess any superior medicinal powers.

PRUNUS LAURO-CERASUS. Cherry-Tree Laurel. *Icosand. Monog. Pomaceæ. Folia. Europe.*

THE leaves of this plant have an odour slightly fragrant; their taste is extremely bitter. They possess a highly narcotic quality, which is extracted by infusion in

alcohol or water, and is even brought over by distillation. It appears to resemble digitalis in its action, but it has not been applied to any medicinal use.

CLASS II.—ANTISPASMODICS.

THIS class might perhaps be considered as a subordinate division of Narcotics. They have similar virtues, being used principally to allay pain and inordinate action, and they differ only in not producing that state of general insensibility and diminished action, which arises from the action of narcotics. This might be supposed owing merely to a difference in power; yet there seems also to be something more than this, since they produce no such effect in any dose, and since, although they are so much inferior to narcotics in this respect, they are equally powerful in repressing inordinate and irregular muscular action. This difference may be explained, on the supposition that they are equally powerful stimulants, but are less diffusible, and more durable in their action, or that they are powerful diffusible stimulants, possessing little direct power of diminishing the excitable principle. Considered in this point of view, they will form an intermediate class between narcotics and tonics; and experience shows, that they partake of the properties of both; several narcotics and tonics being frequently used as antispasmodics.

From the name given to this class, their effects may be easily understood. Spasm is an irregular contraction of a muscle; sometimes the contraction is permanent, at other times it alternates with relaxation, but is still irregular. Such medicines as obviate and remove such affections, are termed Antispasmodics.

Spasm may arise from various causes. One of the most frequent is a strong irritation continually applied; such as dentition or worms. In these cases, narcotics prove useful, by diminishing irritability and sensibility. Sometimes spasm arises from mere debility; and the

obvious means of removing this is by the use of tonics. Both narcotics and tonics, therefore, are occasionally useful as antispasmodics, such as opium, camphor, and ether, in the one class, and zinc, mercury and Peruvian bark in the other. But there are farther several substances which cannot be with propriety referred to either of these classes, and to these the title of Antispasmodics may be more exclusively appropriated.

ANTISPASMODICS.

MOSCHUS.
 CASTOREUM.
 OLEUM ANIMALE EMPYREUMATICUM.
 PETROLEUM.
 AMMONIA.
 FERULA ASSAFOETIDA.
 SAGAPENUM.
 BUBON GALBANUM.
 VALERIANA OFFICINALIS.
 CROCUS SATIVUS.
 MELALEUCA LEUCADENDRON.

Narcotics used as Antispasmodics.

ETHER.
 CAMPHOR.
 OPIUM.

Tonics used as Antispasmodics.

CUPRUM.
 ZINCUM.
 HYDRARGYRUS.
 CINCHONA.

MOSCHUS. Musk. *Moschus moschiferus*. Cl. *Mammalia*. Ord. *Pecora*. *South of Asia*.

MUSK is a peculiar production found in a small sac situated in the umbilicus in the male of the above animal, a native of China, India, and Tartary. It is slightly unctuous, of a black colour, having a strong durable smell, and a bitter taste. It yields part of its active matter to water, by infusion; by distillation the water is impregnated with its flavour; alkohol dissolves it, the impurities excepted.

Musk is an antispasmodic of considerable power; it is administered with advantage in the greater number of spasmodic diseases, especially in hysteria and singultus, and also in diseases of debility. In typhus, it is employed to relieve subsultus tendinum, and other symptoms of a spasmodic nature. In cholera, it frequently stops vomiting, and, combined with ammonia, it is given to arrest the progress of gangrene. Its dose is from six to twenty grains, repeated, if necessary, every five or six hours. It is best given in the form of bolus. To children, it is given in the form of enema, and is an efficacious remedy in the convulsions arising from dentition.

Offic. Prep.—Mist: Mosch. *Lond.*—Tinct: Mosch. *Dub.*

CASTOREUM. Castor. Castor Fiber. *Mammalia*. *Glires*.

CASTOR is a peculiar deposition collected in cells near the extremity of the rectum in the beaver. It is imported from Russia, and an inferior kind from New England. It is slightly unctuous, of a reddish-brown colour; has a strong disagreeable smell, and a bitter acrid taste. Its active matter is dissolved by alkohol, proof spirit, and partially by water; the tincture with alkohol is the least nauseous.

Castor is used as an antispasmodic in hysteria, principally in a dose from ten to twenty grains, or from one to two drachms of the tincture. From the experiments

of Dr. Alexander, it appears to be a remedy of no great power.

Off. Prep.—T: Castor. T: Castor: Comp. *Ed.*

OLEUM ANIMALE EMPYREUMATICUM. Empyreumatic Animal Oil.

THE fresh bones or horns of animals, when exposed to heat in close vessels, afford, from the decomposition principally of the gelatin they contain, an empyreumatic oil of a thick consistence, black colour, and extremely fœtid smell. This by repeated distillations, becomes thinner, nearly colourless and transparent, but remains still fœtid. In this state it has been used as an antispasmodic, in a dose of ten or fifteen drops. It is nearly discarded from practice.

The empyreumatic oil obtained from the decomposition of the bitumen amber by heat (*Ol. Succini*) is very similar in its qualities, and has been used for the same purpose. It is also sometimes applied externally by friction as a stimulant in paralysis and chronic rheumatism.

PETROLEUM, a bitumen of a red colour and thick consistence, of a disagreeable smell, and a bitter acrid taste, has been used as an antispasmodic and sudorific, and externally as a stimulant in paralysis, but at present is scarcely ever employed.

AMMONIA has been used as an antispasmodic, principally under the form of the impure carbonat obtained from the decomposition of animal substances by heat. CARBONAS AMMONIÆ PYRO-OLEOSUS, formerly SAL CORNU CERVI. This consists of carbonat of ammonia impregnated with empyreumatic oil, and to the latter it has been supposed to owe part of its virtues. It was given in hysteria in a dose of from five to fifteen grains. The pure ammonia dissolved in alkohol is used as a solvent of the active matter of valerian, assafœtida and other antispasmodics, and is supposed to promote their operation.

FERULA ASSAFOETIDA. Assafoetida. *Pentand. Digyn. Umbellatæ. Gummi-Resina. Persia.*

ASSAFOETIDA is a concrete juice obtained by exudation from incisions in the roots of the plant. It is in small masses, soft and adhering to each other, yellow on the external surface, white within, having an extremely fœtid smell, and a taste bitter and sub-acrid. It consists of two-thirds of gum, and one-third of resin, its taste and smell residing in the resinous part. It yields all its virtues to alcohol. Triturated with water it forms a milky-like mixture, the resin being diffused by the medium of the gum. Distilled with water, it affords a small quantity of essential oil.

Assafoetida is used as an antispasmodic in different nervous diseases, especially in hysteria, in dyspnœa, tympanitis, pertussis, &c. and is superior in efficacy to any of the fœtid gums. Its usual dose is from five to twenty grains, in the form of pill, or triturated with water. It is likewise given in the form of enema, two drachms being diffused in eight ounces of warm milk or water; and it is sometimes applied externally as a plaster.

Off. Prep.—Alcohol Ammon: Fœtid. Emp: Assafoet. Pil: Aloes cum Assaf. Pil: Assafoet. Tinct: Assafoet. *Ed.*—Lac Assafoet. *Lond.*

SAGAPENUM. *Gummi-Resina.*

THIS gum-resin is the produce of an unknown tree said to be a native of Persia. It is in small masses, of a yellow colour, having a fœtid smell, and a pungent nauseous taste; is soluble in proof spirit; by distillation affords a small quantity of essential oil.

Its virtues and uses are the same as those of assafoetida, to which it is much inferior in power. Dose from ten to twenty grains.

BUBON GALBANUM. Galbanum. *Pentand. Digyn. Umbellatæ. Gummi-Resina. Africa.*

GALBANUM is obtained by exudation from incisions in the stem; it is in the form of an uniform tenacious mass, of a dark brown colour, having a fœtid smell, and a bitter acrid taste.

Alcohol dissolves its resin, in which its principal virtues reside; proof spirit dissolves it entirely, the impurities excepted. Triturated with water, it forms a milky-like fluid; by distillation it affords about one twentieth of its weight of essential oil.

Galbanum possesses the virtues of the fœtid gums, and is used for the same purposes. Dose ten grains.

Offic. Prep.—Pil: Galb: Comp.—Tinct: Galban. *Lond.*

VALERIANA OFFICINALIS. Wild Valerian. *Triand. Monogyn. Aggregatæ. Radix. Indigenus.*

THE root of this plant, which is the part used in medicine, consists of a number of slender fibres matted together, and attached to one head, of a brown colour, having a smell strong and unpleasant, and a warm bitter taste.

Its active matter is extracted equally by water and alcohol. Its infusion changes colour on the addition of sulphat of iron. By distillation water is impregnated with its flavour, but not with its taste. No essential oil is obtained.

Valerian is one of the principal modern antispasmodics, and is used with advantage in hysteria, chorea, epilepsy, and hemicrania. Dose from one scruple to one drachm, three or four times a-day, which is increased gradually as far as the stomach can bear it.

Offic. Prep.—Tinct: Valer. *Lond.*—Valer: Ammon. *Lond. et Dub.*

CROCUS SATIVUS. Saffron. *Triand. Monogyn. Liliaceæ.*
Floris. Stigmata. Indigenous.

THIS substance is composed of the stigmata which crown the pistil of the flower. These are pressed together, and form Cake Saffron. The flavour is aromatic and diffusive, the taste warm and bitterish, the colour a rich yellow. The active matter is equally extracted by alcohol, water, proof spirit, and vinegar; the residuum, which is not more than six parts out of sixteen, being inert woody matter. By distillation with water, a small quantity of essential oil is obtained.

Saffron was formerly regarded as a very active medicine, and as requiring to be given with much caution. Experience has proved it to be nearly inert, and it is now banished from medical practice. It is used as a popular remedy in the exanthemata, particularly in small-pox.

Offic. Prep.—Tinct: Croci. *Ed.*—Syr: Croci. *Lond.*

MELALEUCA LEUCADENDRON. *Polyadelph. Polyand. Hesperideæ. Oleum Volatile. Ol. Cajeputæ. Cajeput Oil. India.*

THE essential oil obtained by distillation from the leaves and fruit has a green or yellowish colour, a strong fragrant odour, and an extremely pungent taste. It is highly volatile.

This oil has been used as a highly diffusible stimulant and antispasmodic, in tympanitis, hysteria, palsy, chronic rheumatism, and various other diseases of debility. Its dose is three or four drops. It is also applied externally to relieve rheumatic and gouty pains, and generally succeeds in relieving the pain of toothach, when applied to the affected tooth.

CLASS III.—TONICS.

By Tonics, are understood those substances whose primary operation is to give strength to the system. Their operation is not mechanical, as was once conceived; they act not on the simple solids, increasing their tension or tone, but on the living fibre, and are merely powerful stimulants permanent in their operation. By producing a gradual excitement, they give vigour to the actions of the system, and as that excitement is gradually produced, it is in like manner gradually diminished, and the habitual stimuli continuing to operate, diminished action does not succeed. Where tonics, however, are given in excess, are used unnecessarily, or for too long a time, they weaken the powers of life.

Tonics act primarily on the stomach, the action they excite in that organ being communicated generally by the medium of the nerves to the rest of the system. Some of them, however, are received into the mass of blood.

The immediate effects of a tonic, given in a full dose, are to increase the force of the circulation, to augment the animal heat, promote the various secretions, or moderate them when morbidly increased, quicken digestion, and render muscular action more easy and vigorous. By some of them, however, these effects are very slowly induced.

The affections of the system in which tonics are employed, must be obviously those of debility; hence their use in the greater part of the diseases to which mankind are subject.

This class may be subdivided into those individuals derived from the Mineral, and those from the Vegetable kingdoms.

TONICS.

From the Mineral Kingdom.

HYDRARGYRUS.
 FERRUM.
 ZINCUM.
 CUPRUM.
 ARSENICUM.
 BARYTES.
 CALX.
 ACIDUM NITRICUM.
 OXY-MURIAS POTASSÆ.

From the Vegetable Kingdom.

CINCHONA OFFICINALIS.
 CINCHONA CARIBÆA.
 CINCHONA FLORIBUNDA.
 ANGUSTURA.
 ARISTOLOCHIA SERPENTARIA.
 DORSTENIA CONTRAYERVA.
 CROTON ELEUTHERIA.
 COLOMBA.
 QUASSIA EXCELSA.
 QUASSIA SIMAROUBA.
 SWIETENIA FEBRIFUGA.
 SWIETENIA MAHAGONI.
 GENTIANA LUTEA.
 ANTHEMIS NOBILIS.
 ARTEMISIA ABSINTHIUM.
 CHIRONIA CENTAURIUM.
 MARRUBIUM VULGARE.
 MENYANTHES TRIFOLIATA.
 CENTAUREA BENEDICTA.
 CITRUS AURANTIUM.
 CITRUS MEDICA.
 LAURUS CINNAMOMUM.
 LAURUS CASSIA.

CANELLA ALBA.
 ACORUS CALAMUS.
 AMOMUM ZINGIBER.
 KÆMPFERIA ROTUNDA.
 SANTALUM ALBUM.
 PTEROCARPUS SANTALINUS.
 MYRISTICA MOSCHATA.
 CARYOPHYLLUS AROMATICUS
 CAPSICUM ANNUUM.
 PIPER NIGRUM.
 PIPER LONGUM.
 PIPER CUBEBA.
 MYRTUS PIMENTA.
 AMOMUM REPENS.
 CARUM CARUI.
 CORIANDRUM SATIVUM.
 PIMPINELLA ANISUM.
 ANETHUM FOENICULUM.
 ANETHUM GRAVEOLENS.
 CUMINUM CYMINUM.
 ANGELICA ARCHANGELICA.
 MENTHA PIPERITA.
 MENTHA VIRIDIS.
 MENTHA PULEGIUM.
 HYSSOPUS OFFICINALIS.

TONICS FROM THE MINERAL KINGDOM.

THESE are in general more local in their nature than the vegetable tonics, they do not operate so speedily, and seldom occasion considerable excitement.

HYDRARGYRUS. Argentum Vivum. Mercurius. Mercury or Quicksilver.

MERCURY, though not usually arranged under this class, unquestionably belongs to it. In the words of Dr. Cullen, it acts as a stimulus to every sensible and moving

fibre of the body, and it produces the most permanent excitement. Hence it is the most general evacuant belonging to the *Materia Medica*; and from its stimulant operation, its utility in many diseases may be explained.

Mercury is a metal, fluid at nearly the lowest natural temperature; it congeals at 40° below 0 of Fahrenheit's scale; its specific gravity is to that of water as fourteen to one; it evaporates at 600° ; and at the same temperature is oxydated by exposure to atmospheric air. It suffers the same change at a lower temperature by agitation or trituration.

Quicksilver is found native, but more generally in combination with sulphur, from which it is obtained by distillation, with the addition of lime and iron. It is imported from Spain and Hungary. It is sometimes adulterated with lead and other metals; a fraud which is detected by exposing the metal to heat in an iron spoon, when the mercury, if pure, is entirely volatilized.

Mercury is not now used by itself in medicine; but its preparations are extensively employed, and are very active remedies.

When rendered active by the various substances with which it is combined in these preparations, it is a powerful and permanent stimulus; which, as it is received into the blood, is applied to every part of the body. By its direct stimulant power, or by the indirect evacuating effects which it produces, it is employed with the utmost advantage in various spasmodic diseases; in tetanus and hydrophobia; in the fevers of warm climates; in rheumatism, acute and chronic; in visceral obstructions, and in many other chronic morbid affections.

Its principal medicinal virtue, however, is that of curing lues venerea. Its mode of operation in this case has given rise to many disputes: some ascribing its efficacy to the evacuation it occasions; others considering it as an antidote to the venereal poison; while some ascribe its efficacy to its general and permanent stimulant operation, by which it induces and keeps up an action incompatible with that which constitutes lues venerea, till at length the virus is changed, or eliminated from the body by the usual discharges. This latter opinion,

originally proposed by Mr. Hunter, seems to afford the most satisfactory solution.

For the cure of syphilis, mercury is administered, until moderate salivation is excited; and this is kept up for some time, longer or shorter, proportioned to the kind and violence of the symptoms. Cold is to be guarded against, as tending to induce profuse salivation. When this occurs, it may be moderated by opium, a brisk cathartic, the application of a blister to the throat, and, as has been affirmed, by the administration of sulphuret of potash.

The mildest preparations of mercury are those in which it is oxydated by simple trituration. Rubbed with mucilage, it forms Plenck's Solution; with chalk, the Hydrargyrus cum Creta of the London Pharmacopœia; and with manna or conserve of roses, the common Mercurial Pill. The latter is one of the best preparations. Given in a dose of eight grains morning and evening, it soon affects the system; in a larger dose, it is apt to run off by the bowels.

Triturated with lard, mercury forms the Mercurial Ointment, the strongest ointment being composed of equal parts of each. The mercury exists in it partly in a state of extreme mechanical division, partly oxydated, and partly, as some have conjectured, combined with sebacic acid. Rubbed upon the skin, in the quantity of one drachm every evening, the mercury is taken up by the absorbents; and in local venereal symptoms, as bubo, or where the intestines are very irritable, this method of introducing it is of the utmost advantage.

The Mercurial Plaster is the metal triturated with melted resin and oil, and mixed with litharge plaster: it is applied to glandular tumors, venereal or not, as a discutient.

Mercury oxydated by exposure to the atmospheric air, at a high temperature, (Oxidum Hydrargyri Rubrum, Hydrargyrus Calcinatus), affords a preparation, supposed by some to be the most uniform in its strength, and most certain in its operation, of all the mercurials. Its dose is one grain night and morning.

Various preparations are obtained from the metal oxydated by the acids. The Nitrat of Mercury decomposed by heat, furnishes the Oxidum Hydrargyri Rubrum per Acidum Nitricum, or more properly the Sub-nitras Hydrargyri, in which the metal is highly oxydated, and to which there also adheres a small portion of the acid. It is used only externally as an escharotic. By the action of ammonia, the acid is not only completely abstracted, but the metallic oxyd is also deprived of part of its oxygen. A black or gray oxyd is thus obtained, (Oxidum Hydrargyri Cinereum), which is comparatively a mild preparation. Its dose is one or two grains. Mercury oxydated by the sulphuric acid, forms the yellow oxyd. (Sub-Sulphas Hydrargyri, olim Turpethum Minerale), to which a small quantity of acid still adheres. In a dose of three or four grains, it acts as a powerful emetic.

The preparations in which the mercury is saturated with an acid, are very active. The Nitrous solution of it is highly caustic. Mixed with lard, it forms an ointment, Unguentum Hydrargyri Nitrati, used in cutaneous diseases.

Mercury, combined with the muriatic acid, forms two very active preparations, the Murias Hydrargyri, and Sub-Murias Hydrargyri.

The first of these, Corrosive Muriat of Mercury, or, as it was named, Corrosive Sublimate of Mercury, is composed of the metal highly oxydated, and combined with a large proportion of muriatic acid. The proportions are 69.6 mercury, 12.3 oxygen, and 18 of acid. It is the most virulent of all the preparations of this metal, and cannot be given with safety in a larger quantity than one fourth of a grain: its medium dose is one sixth or one eighth. It acts more generally on the system than any other preparation, and very speedily arrests the progress of syphilis. But it is occasionally violent in its operation, and its effects are not permanent, the disease frequently returning in the same or some other form. A very dilute solution of it is used as a collyrium in venereal ophthalmia, as a gargle in venereal sore-throat, as an injection in gleet, and as a lotion in some cutaneous affections.

The Sub-Muriat, Mild Muriat of Mercury, or Calomel, is obtained by combining the corrosive muriat with nearly an equal part more of the metal. Its constituent parts, therefore, are the same, and it differs from the corrosive muriat merely in the mercury being less highly oxydated, and in that oxyd being combined with a smaller proportion of muriatic acid. The proportions are, mercury 79, oxygen 9.5, and acid 11.5. It is mild in its operation, and is one of the most useful of the mercurial preparations. In syphilis it is given in the dose of a grain night and morning; it is likewise administered with the greatest advantage in glandular obstructions, dropsy, chronic rheumatism, hydrocephalus, hydrophobia, the fevers of warm climates, and many other diseases. In some of these diseases, as hydrophobia or hydrocephalus, it is necessary to give it in very large doses. As a cathartic it is equally mild and effectual in its operation.

Murias Hydrargyri Ammoniacalis, Calx Hydrargyri Alba of the London Pharmacopœia, is prepared by decomposing corrosive muriat of mercury by ammonia. A precipitate is obtained, which consists of oxyd of mercury holding combined with it muriatic acid and a small quantity of ammonia. It is too acrid for internal use, but is employed externally as a mild escharotic, and as an application in various cutaneous affections.

With the acetous acid mercury forms the Acetis Hydrargyri, a salt which is the basis of Keyser's pills, a medicine once highly celebrated. It is mild, but uncertain in its operation. Its dose is from two to five grains.

With phosphoric acid, the Phosphat of Mercury is formed, a preparation of considerable activity and certainty. The dose of it is one grain.

These preparations of mercury, often require to be combined with opium, to obviate irritation, and prevent them from running off by the bowels. They are also in different diseases combined with several other active medicines.

Two preparations remain, in which the metal is combined with sulphur. The Hydrargyrus Sulphuratus Ni-

ger consists of equal parts of mercury and sulphur triturated together, so as to form a black powder. It is a very inactive preparation, and has been used only as an anthelmintic, in a dose to an adult of one scruple or half a drachm. The Hydrargyrus Sulphuratus Ruber or Cinnabar, is the mercury united with about one-fourth of its weight of sulphur by sublimation. It is used only to fumigate venereal ulcers.

FERRUM. Iron.

A METAL very abundant in nature, of a bluish grey colour, highly ductile, scarcely fusible, but easily oxydated in atmospheric air, and subject to rust. It is considered as the metal most friendly to the human frame, acting always as a powerful tonic, increasing the power of digestion, quickening the circulation, and causing the blood, it is said, to assume a more florid hue. It is still a subject of dispute, whether it acts merely on the stomach and intestinal canal, or whether it enters into the blood.

The diseases in which it is used are those of chronic debility, especially chlorosis, dyspepsia, hypochondriasis, hysteria, paralysis, and rickets.

The Limatura Ferri, or filings of iron, are given in any dose from one scruple to a drachm or two; their activity is entirely dependent on the quantity of acid present in the stomach.

The Red Oxyd of iron is given in a dose of five grains.

The Carbonat, or Rust of Iron, is the metal oxydated by exposure to the air with moisture, and combined with carbonic acid; it is more active than the pure métal, and less irritating than the saline preparations. Dose from five to twenty grains.

The Murias Ferri Ammoniacalis, vel Ferrum Ammoniatum, is a mixture of muriat of iron and muriat of ammonia. It is still more active than the rust. Dose from five to twelve grains.

The *Tinctura Ferri Muriati* is a solution of the muriat of iron in alkohol. It is a very active preparation; sometimes too much so in an irritable state of the stomach. Its dose is ten or fifteen drops in a glass of water.

The Sulphat of Iron, or combination of iron and sulphuric acid, is a salt highly active, and possessing more of an astringent power than any of the other preparations. Hence, besides its use in diseases of general debility, it is preferred to the others in menorrhagia, and some other cases of morbid evacuations. The medium dose of it is five grains.

The Chalybeate Waters are natural combinations of iron, often used with still more advantage.

ZINCUM. Zinc.

A METAL of a bluish white colour, brittle, melting in a moderate heat, and burning with a bright green flame; obtained from calamine, a native oxyd of the metal.

Oxyd of Zinc, prepared by burning the pure metal, has been used as a tonic in epilepsy, chorea, and some other spasmodic diseases. The dose is from ten to twenty grains.

The Sulphat of Zinc has been used in the same cases in a dose from one to three grains. In a dose of five or ten grains it acts as an emetic. Its solution in water is used as an astringent injection in gonorrhœa, and as a collyrium in ophthalmia.

CUPRUM. Copper.

A METAL of a red colour, oxydated by heating it in atmospheric air, having an unpleasant styptic taste, and poisonous even in a small dose. Its tonic power, like that of zinc, is estimated by its successful exhibition in epilepsy and some other spasmodic diseases, dependent on or connected with debility. A peculiar preparation of it, the *Ammoniaetum Cupri*, is given in the dose of half a grain twice a-day, increasing it gradually as far as the stomach or system will bear it. The Sulphat of Copper is a powerful astringent, and an escharotic, and as such is

used externally. In a dose of two or three grains, taken internally, it proves emetic.

ARSENICUM. Arsenic.

A METAL of a dark-gray colour, very volatile, and easily oxydated. By oxydation it is converted into a white powder, which has been considered as an oxyd, and lately, perhaps more justly, as an imperfect acid. This substance, the White Arsenic of commerce, is obtained by sublimation from arsenical ores. Its taste is penetrating and corrosive; its effects are those of a violent local stimulant; it occasions sickness, incessant vomiting, inflammation, and even erosion of the stomach. The consequences which more slowly succeed its administration in too large a dose, are paralysis and other symptoms connected with indirect debility.

Though the most violent of the mineral poisons, it equals, when properly administered, the first medicines belonging to the class under which we have arranged it. Its principal medicinal application has been for the cure of intermittent fever.

The arsenical solution of Fowler, a combination of arsenious acid and potash dissolved in water, is given in a dose of four drops, three times a-day, and gradually increased to double that quantity; its use being occasionally intermitted, not persisted in if it does not soon prove effectual, and immediately relinquished if it occasion nausea or purging. The arseniat of potash, or of soda, is used in the same manner, in the dose of the eighth part of a grain of the crystallized salt. In the same form it has been used in remitting fever, in periodical headach, in dropsy, hydrophobia, and elephantiasis. There seems little propriety in having recourse to it in these diseases, at least in which other remedies less dangerous are capable of effecting a cure. Externally, it is used in scirrhus and cancer; these applications of it will be noticed under the class of Escharotics.

The antidotes which have been recommended to the poison of arsenic are various. Vomiting must be iname-

diately excited, and as the stomach is highly irritable in such cases, the milder emetics, and especially oil, which is supposed to involve the particles of the poison, have been recommended. According to the assertion of Renault, oil appears from experiments rather to favour its action, and tepid water, or mucilaginous liquors, ought to be preferred. Reliance has been placed on solutions of the alkaline sulphurets, or of sulphurated hydrogen. The latter appears, from Renault's experiments, to have some power, since, if it were previously combined with the arsenious acid, it rendered it nearly inert; but if merely introduced into the stomach with it, or after it had been swallowed, especially if the arsenic were not dissolved, it seemed to have little efficacy as an antidote.

BARYTES. Terra Ponderosa. Heavy Earth.

THIS earth is found in nature combined with sulphuric acid, and with carbonic acid. The native carbonat is poisonous to animals. The form under which the barytes has been used in medicine, is in combination with the muriatic acid; for the preparation of which a formula has been inserted in the Edinburgh Pharmacopœia. The saturated solution of this salt was introduced by Dr. Crawford, as a remedy in scrofula, and it has since been used in various forms of hectic fever. Its effects are to improve the appetite and general strength; sometimes it occasions diaphoresis or diuresis. Its dose is five drops, gradually increased to twenty or more. In too large a dose it occasions sickness, vertigo, tremors, and insensibility.

CALX. Lime.

THIS earth exists abundantly in nature combined with carbonic and other acids. From the native carbonat it is obtained by expelling the carbonic acid by heat. The pure lime is soluble in water in small quantity; the solution has a styptic taste. It is used with advantage in dyspepsia, its beneficial effects arising probably in part from

its astringent power, and partly from its chemical agency in neutralizing acidity. As a pure tonic, the combination of it with muriatic acid has been represented as of much efficacy, and as being at least equal to the muriat of barytes. Like it, it has been used in scrofula and hectic fever, and also in dyspepsia. Its dose is from half a drachm to a drachm of the saturated solution.

ACIDUM NITRICUM. Nitric Acid.

THIS acid is the product of the saturation of azot with oxygen, and is generally obtained by decomposing nitrat of potash by sulphuric acid, assisted by heat. It is colourless, emits white fumes; specific gravity 1504; is extremely corrosive, and possesses all the acid properties.

The tonic powers of this acid are conspicuous in supporting the system under a mercurial course. As a remedy against lues venerea, from the evidence that has been collected, it is undeniable that it is capable of counteracting the syphilitic poison. The secondary symptoms of the disease have disappeared under its use, and the primary symptoms been completely removed. It is however inferior to mercury in the certainty of its operation, but is a valuable remedy combined with it, both as promoting its operation, and as obviating the injurious effects of mercurial irritation. With such views, it is given in a dose of from one to two drachms, largely diluted with water, in the course of the day. It is likewise administered with advantage in dyspepsia, and in that chronic affection of the liver frequently arising from residence in a warm climate.

OXY-MURIAS POTASSÆ. Oxy-muriat of Potash.

THIS salt, which strictly speaking is the Hyper-oxygenated Muriat of Potash, is prepared by introducing a current of oxy-muriatic acid gas into a solution of potash. Common muriat, and hyper-oxygenated muriat of potash are formed, the latter separating by crystallization in brilliant white flakes.

As a remedy, it may be classed with the nitric acid; its operation in checking or removing the symptoms of syphilis is similar; it also increases the force of the circulation, and excites the actions of the system. Its efficacy as an anti-venereal is considered as superior to that of the nitric acid. The dose in which it is given is ten grains three or four times a-day, and increased gradually to twenty or twenty-five.

TONICS FROM THE VEGETABLE KINGDOM.

THE tonic power in vegetables is intimately connected with certain sensible qualities, with their bitterness, astringency, and aromatic quality, all of them perhaps possessing these qualities, though, in each, one may be more predominant than the other. The purest bitters, astringents, and aromatics, possess also more or less of a tonic power. Of these divisions, the pure astringents form a distinct class; the remaining tonics may be arranged according as the bitterness or aromatic quality is predominant in them.

The stimulant operation of the purer Bitters is little diffusible, and very slow in its operation; their effects are principally on the stomach and digestive organs, to which they communicate vigour, though they also act in some degree on the general system, and obviate debility, as is evident in particular from their efficacy in intermittent fevers, in dropsy, and gout, and from their debilitating effects when used for too long a time.

Aromatics are more rapid and diffusible in their action; they quicken the circulation, and augment the heat of the body. Their action has little permanence; hence, in medicine, they are employed either as mere temporary stimulants, or to promote the action of bitters or astringents.

From these different modes of action of bitters and aromatics, it is evident, that a more powerful tonic will be obtained from the combination of these qualities than

where they exist separately. The most powerful tonics are accordingly natural combinations of this kind. These may first be considered, proceeding afterwards to the more pure bitters and aromatics.

CINCHONA OFFICINALIS. Cortex Peruvianus. Peruvian Bark. *Pentand. Monogyn. Contortæ. Cortex. Peru.*

THE tree affording this bark grows wild in the hilly parts of Peru; the bark is stripped from the branches, trunk, and root, and dried. Three kinds of it are now in use, the Pale, Red, and Yellow, which some have considered as mere varieties, though they more probably are different species.

The Pale bark is in the form of small quilled twigs, thin, breaking close and smooth, friable between the teeth, covered with a rough coat of a brownish colour, internally smooth and of a light brown; its taste is bitter, and slightly astringent; flavour slightly aromatic, with some degree of mustiness.

The Red is in large thick pieces, externally covered with a brown rugged coat, internally more smooth and compact, but fibrous; of a dark red colour; taste and smell similar to that of the pale, but the taste rather stronger.

The Yellow, so termed because it approaches more to that colour than either of the others do, is in flat pieces, not convoluted like the pale, nor dark-coloured like the red; externally smooth, internally of a light cinnamon colour, friable and fibrous; has no peculiar odour different from the others, but a taste incomparably more bitter, with some degree of astringency.

From the general analysis of bark, it appears to consist, besides the woody matter which composes the greater part of it, of gum, resin, gallic acid, of very small portions of tannin and essential oil, and of several salts having principally lime for their basis. Seguin has also supposed the existence of gelatin in it, but without sufficient proof. Cold water infused on pale bark for some hours,

acquires a bitter taste with some share of its odour; when assisted by a moderate heat, the water takes up more of the active matter: by decoction, a fluid, deep coloured, of a bitter styptic taste, is obtained, which, when cold, deposits a precipitate of resinous matter and gallic acid. By long decoction, the virtues of the bark are nearly destroyed, owing to the oxygenation of its active matter. Magnesia enables water to dissolve a larger portion of the principles of the bark, as does lime, though in an inferior degree. Alcohol is the most powerful solvent of its active matter. Brandy and other spirits and wines afford also strong solutions in proportion to the quantity of alcohol they contain. A saturated solution of ammonia is also a powerful solvent; vinegar is less so even than water. By distillation, water is slightly impregnated with the flavour of bark; it is doubtful whether any essential oil can be obtained.

The action of menstrua on the red bark is nearly the same, the solutions only being considerably stronger, or containing a larger quantity of resinous matter, and of the astringent principle.

The analysis of the yellow bark shows that its active principles are more concentrated than in either of the others, affording to water, alcohol, &c. tinctures much stronger both in bitterness, and astringency, especially in the former quality.

From the general analysis of these barks, it appears that they consist of nearly the same proximate principles, which vary in their proportions; the most active component parts are the resin, extractive matter, and the gallic acid, and these in combination probably constitute the tonic quality of the bark. In the best pale bark, this active matter amounts to about one-eighth part.

The red bark has been considered as superior in efficacy to the pale, though what is now met with in the shops is undoubtedly inferior; the yellow is represented, apparently with justice, as being more active than either of the others.

The effects of Peruvian bark are those of a powerful and permanent tonic, so slow in its operation that its stimulating property is scarcely perceptible by any alteration

in the state of the pulse, or of the temperature of the body. In a large dose, it occasions nausea and headach; in some habits it operates as a laxative; in others it occasions costiveness.

It is one of those medicines, the efficacy of which in removing disease is much greater than could be expected, *à priori*, from its effects on the system in a healthy state.

Intermittent fever is the disease for the cure of which bark was introduced into practice, and there is still no remedy which equals it in power.

The disputes respecting the mode of administering it are now settled. It is given as early as possible, with perhaps the previous exhibition of an emetic to evacuate the stomach; it is repeated in the dose of one scruple or half a drachm every second or third hour, during the interval of the paroxysm; and it may even be given with safety during the hot fit, but it is then more apt to excite nausea.

In remittent fever it is given with equal freedom, even though the remission of the fever may be obscure.

In those forms of continued fever which are connected with debility, as in typhus, cynanche maligna, confluent small-pox, &c. it is regarded as one of the most valuable remedies. It may be prejudicial, however, in those diseases where the brain or its membranes are inflamed, or where there is much irritation, marked by subsultus tendinum, and convulsive motions of the extremities; and in pure typhus it appears to be less useful in the beginning of the disease than in the convalescent stage.

Even in fevers of an opposite type, where there are marks of inflammatory action, particularly in acute rheumatism, bark has been found useful, after blood-letting.

In erysipelas, in gangrene, in extensive suppuration, and venereal ulceration, the free use of bark is of the greatest advantage.

In the various forms of passive hæmorrhagy, in many other diseases of chronic debility, dyspepsia, hypochondriasis, paralysis, rickets, scrofula, dropsy, and in a variety of spasmodic affections, epilepsy, chorea, and hysteria, it is administered as a powerful and permanent

tonic, either alone, or combined with other remedies suited to the particular case.

Its usual dose is half a drachm. The only inconvenience of a larger dose is its sitting uneasy on the stomach. It may, therefore, if necessary, be frequently repeated, and in urgent cases may be taken to the extent of one ounce, or even two ounces, in twenty-four hours.

The powder is more effectual than any of the preparations; it is given in wine, in any spiritous liquor, or, if it excite nausea, combined with an aromatic. The cold infusion is the least powerful, but most grateful; the decoction contains much more of the active matter of the bark, and is the preparation generally used when the powder is rejected; its dose is from two to four ounces. The spiritous tincture, though containing still more of the bark, cannot be extensively used on account of the menstruum, but is principally employed, occasionally and in small doses of two or three drachms, as a stomachic. The extract is a preparation of considerable power, when properly prepared, and is adapted to those cases where the remedy requires to be continued for some time. It is then given in the form of pill, in a dose from five to fifteen grains.

Bark is likewise sometimes given in the form of enema; one scruple of the extract, or two drachms of the powder, being diffused in four ounces of starch mucilage. The decoction is also sometimes applied as a fomentation to ulcers.

Offic. Prep.—Decoct: Cinch. Extr: Cinch. Inf: Cinch. Tinct: Cinch: *Ed.*—Extr: Cort: P. Extr: Cort: P: cum resina. T: Cinch: Am. T: Cinch: C. *Lond.*

CINCHONA CARIBÆA. Caribæan Bark.

THIS species, belonging to the same genus, a native of the Caribbee Islands, has been proposed as a substitute to Peruvian bark, and has as such been received into the Edinburgh Pharmacopœia. It is more bitter, and less aromatic. The Cinchona Floribunda, or St. Lucia bark, has been also recommended, and sometimes used.

ANGUSTURA

Is a bark imported within these few years from the Spanish West Indies, the botanical characters of the tree producing it being unknown. It is in flat pieces, externally gray and wrinkled; internally, of a yellowish-brown, and smooth; has little flavour; taste, bitter and slightly aromatic. Water, assisted by heat, takes up the greater part of its active matter, which does not seem to be injured even by decoction. Alcohol dissolves its bitter and aromatic parts, but precipitates the extractive matter dissolved by water. Proof spirit is its most proper menstruum. By distillation, it affords a small quantity of essential oil. The powdered bark, triturated with lime or potash, and water, gives a smell of ammonia.

Angustura is a powerful antiseptic. It was originally introduced in the West Indies as a remedy in fevers, equal or even superior to the Peruvian bark. In this country, it has been principally used in obstinate diarrhœa, and in chronic dysentery, and with advantage. Its dose is from ten to twenty grains of the powder, or one drachm in infusion or decoction. Its tincture with proof spirit in a dose of one or two drachms has been used in dyspepsia.

ARISTOLOCHIA SERPENTARIA. *Serpentaria Virginiana.*
Virginian Snake-root. Gynand. Hexand. Sarmentos.
Radix. Virginia, Carolina.

THIS root consists of a number of small fibres, issuing from one head, of a light brown colour, having a slightly aromatic smell, and a pungent bitterish taste. Its active matter is extracted partially by water, and by alcohol; entirely by proof spirit. By distillation, it affords a small quantity of an essential oil; fragrant, but not pungent.

Serpentaria is a stimulating aromatic tonic, formerly much employed in fevers of the typhoid kind, to support the powers of the system. It was given in a dose of from

ten to twenty grains every fourth or fifth hour. It promotes the efficacy of cinchona in the cure of intermittents and remittents, and is a remedy of considerable power in dyspepsia. It is given in substance, or in the form of tincture.

Offic. Prep.—T: Arist: Serpent. *Ed.*

DORSTENIA CONTRAYERVA. Contrayerva. *Triand. Monog. Scabrid. Radix. Peru, W. Indies.*

THIS root is in small knotted pieces, of a yellowish colour; has an aromatic smell, and a bitterish taste; yields its active matter to water and alcohol. Contrayerva was formerly used as a stimulant in typhoid fever, in a dose from five to twenty grains. The compound powder of it, of the London Pharmacopœia, is used as a remedy in diarrhœa.

Offic. Prep.—P: Contrayerv: C. *Lond.*

CROTON ELEUTHERIA. Cascarilla. *Monoec. Monadelph. Tricoccæ. Cortex. Bahama Islands, North America.*

CASCARILLA bark is in small quills; has a slightly aromatic smell, and a warm bitter taste; is highly inflammable. It has been used as a substitute for the Peruvian bark, and has been recommended as a remedy in dysentery, and in obstinate diarrhœa. Its usual dose is a scruple or half a drachm.

Offic. Prep.—Extr: Casc. T: Casc. *Lond.*—Extr: Casc: cum Resin. *Dub.*

COLOMBA.

OF the plant which furnishes this root, no botanical account has been obtained. It is brought from Ceylon in round pieces; the sides covered with a bark; the woody part of a light yellow colour. It has an aromatic smell, and a bitter taste. It yields its bitterness to water, but proof-spirit is its proper menstruum.

Colomba is a powerful antiseptic and bitter; it is used with much advantage in affections of the stomach and intestinal canal, accompanied with redundance of bile; it is also employed in dyspepsia. Its dose is half a drachm of the powder, which in urgent cases may be repeated every third or fourth hour.

Offic. Prep.—Tinct: Colomb. *Ed.*

QUASSIA EXCELSA. Quassy. *Decand. Monogyn. Grinales. Lignum. West Indies.*

THE wood of this tree is of a white colour; has a taste intensely bitter; no odour. The bitterness is extracted equally by water and by alcohol.

It is used as a remedy in dyspepsia, diarrhœa, and in remittent and intermittent fevers. It is also employed to check vomiting. It is commonly given in the form of the watery infusion; in substance, its dose is from ten to thirty grains.

QUASSIA SIMAROUNBA. Simarouba. *Decand. Monogyn. Grinales. Cortex. South America.*

SIMAROUNBA Bark is in long pieces, of a fibrous texture and yellowish colour; destitute of odour; has a strong bitter taste. It is however very variable in its sensible qualities, some having scarcely any bitterness. Water and alcohol dissolve its active matter; the solution in either suffers no change from sulphat of iron.

Simarouba has been celebrated as a remedy in dysentery and chronic diarrhœa. It has been given generally in the form of decoction: in substance the dose is one scruple.

SWIETENIA FEBRIFUGA. Swietenia. *Decand. Monogyn. Trihilatæ. Cortex. East Indies.*

THE bark of the wood of this tree is of a red colour internally; has an astringent bitter taste; yields its active matter to water. It has been proposed as a substitute for

Peruvian bark, and has been used as such with advantage. Dose half a drachm.

SWIETENIA MAHAGONI. Mahogany.

THIS species, of the same genus as the preceding, has similar qualities and virtues. The bark of it has therefore been received into the Edinburgh Pharmacopœia.

GENTIANA LUTEA. Gentian. *Pentand. Digyn. Rotacæ.*
Radix. Switzerland, Germany.

THIS root is in long flexible pieces, and has a very bitter taste, without any peculiar flavour. This bitterness is extracted both by water and alcohol.

Gentian is a common remedy in dyspepsia, in the form of infusion or tincture; and as a bitter, forms the basis of many stomachic remedies. In substance it has been used for the cure of intermittents, in a dose of half a drachm.

Offic. Prep.—Extr: Gent: Lut. Inf: Gent: C. T: Gent: C. T: Rhei cum Gent. Vin: Gent: C. *Edin.*

ANTHEMIS NOBILIS. Chamæmelum. Chamomile. *Syn-
genes. Polygam. superfl. Compositæ. Flores. Indige-
nous.*

THERE are two varieties of these flowers; the single and double flowered: the former is much stronger, the odour and taste residing not in the white petals, but in the disk or tubular florets. Both have a bitter nauseous taste, and a strong unpleasant odour. The taste is extracted by water and alcohol. Distilled with water, they yield a small quantity of essential oil.

Chamomile is a powerful bitter, and as such is used in dyspepsia. Its infusion, when strong, acts as an emetic, and is often used to promote the action of other emetics. In substance, it has been given as a remedy in intermittent fever, in a dose of half a drachm three or four times a-day.

Offic. Prep.—Decoct: Anth: N. Extr: Anth: N. *Edin.*

THE following plants, possessing bitterness in a greater or less degree, were formerly much employed, but are now discarded from practice. They possess no virtues but those of bitters, and as they have all more or less of a nauseous flavour, gentian, colomba or quassia is preferred to them. It is necessary to notice only their botanical characters.

ARTEMISIA ABSINTHIUM. Wormwood. *Syngenes. Polygam. superfl. Compositæ. Herba. Indigenous.*

CHIRONIA CENTAURIUM. Centaury. *Pentand. Monogyn. Rotacææ. Herba.*

MARRUBIUM VULGARE. Hoarhound. *Didynam. Gymnosperm. Verticillatæ. Herba.*

MENYANTHES TRIFOLIATA. Trefoil. *Pentand. Monog. Rotacææ. Herba.*

CENTAUREA BENEDICTA. Blessed Thistle. *Syngenes. Polygam. frustran. Compositæ. Herba. Spain.*

AROMATICS.

THE substances belonging to this subdivision of the vegetable tonics, stimulate the stomach and general system, augment the force of the circulation, and increase the heat of the body. They are scarcely sufficiently permanent in their action to be used by themselves as Tonics; but they always promote the action of bitters and astringents, and are used with advantage to obviate symptoms arising from debility of the stomach or intestinal canal. Their aromatic quality in general resides in an essential oil, which in each of them varies in flavour, pungency, and other sensible qualities, but which is nearly

alike in its chemical properties. It is soluble entirely in alcohol, is sparingly soluble in water, and is extracted from them by distillation.

CITRUS AURANTIUM. Orange. *Polyadelph. Icosand. Pomaceæ. Cortex flavus; Fructus; Fructus immaturus. India.*

THE outer yellow rind of the fruit of the orange has a grateful aromatic flavour, and a warm bitterish taste. Both are extracted by water, and by distillation a small quantity of essential oil is obtained. Its qualities are those of an aromatic and bitter. It has been employed to restore the tone of the stomach, and is a very common addition to combinations of bitters used in dyspepsia. It has likewise been given in intermittents in a dose of a drachm twice or thrice a-day.

Offic. Prep.—Aq: Citri Aur. Cons: Citr: Aur. Syr: Citr: Aur. Ol: Citr: Aur. *Ed.*—T: Cort: Aur. *Lond.*

THE unripe fruit, *Aurantia Curasslaventia*, retain when dried the aromatic flavour of the peel, with rather a larger share of bitterness, and are applied to the same uses.

CITRUS MEDICA. Lemon. *Polyadelph. Icosand. Pomaceæ. Cortex fructûs. Asia.*

THE exterior rind of the fruit of the lemon, is similar in flavour and taste to that of the orange, but is rather less bitter. It has been alleged also that its flavour is more perishable, and it is less frequently used.

Offic. Prep.—Aq: Citr: Med. Syr: Citr: Med. Ol: Ess: Citr: M. *Ed.*

LAURUS CINNAMOMUM. Cinnamon. *Enneand. Monogyn. Oleraceæ. Cortex. Ceylon.*

CINNAMON is the interior bark of the tree; it is thin and convoluted, of a texture somewhat fibrous, of a light brown colour, having an agreeable pungent taste, with a

degree of sweetness, and an aromatic flavour. Its virtues chiefly depend on a small quantity of essential oil which it contains.

Cinnamon is the most grateful of the aromatics. It is used to cover the flavour of other medicines, and to reconcile them to the stomach. It is also employed by itself as a moderate stimulant. The watery infusion of it is given with advantage to relieve nausea and check vomiting.

Offic. Prep.—Aq: L: Cinn. Sp: L: Cinn. T: L: Cinn. T: L: Cinn: C. *Ed.*

LAURUS CASSIA. Cassia. *Enneand. Monogyn. Oleaceæ. Cortex. Flores nondum expliciti. East Indies.*

THE Cassia Bark resembles that of cinnamon in appearance, taste and flavour; but is distinguished by its taste being more pungent, less sweet and more mucilaginous than that of the real cinnamon; by its texture being denser, or less shivery; and by the pieces of it being thicker and less convoluted. Its aromatic quality, like that of cinnamon, resides in an essential oil. It affords a distilled water, stronger, but less agreeable than that of the genuine cinnamon.

Cassia is used for the same purposes as cinnamon; it is much less agreeable to the stomach, however, and cannot be with propriety substituted for the other, where there is nausea or vomiting.

Offic. Prep.—Aq: L: Cass. *Ed.*

The dried buds of the cassia have a taste and flavour similar to the bark, and are used for the same purposes.

CANELLA ALBA. *Dodecand. Monogyn. Oleraceæ. Cortex. West Indies.*

THIS is the inner bark of the branches of the tree. It is in quills or flat pieces, of a light brown or grayish colour; its flavour is aromatic, and its taste pungent. By distillation it affords a thick essential oil.

Canella is a moderately strong aromatic, and is em-

ployed principally on account of its flavour. It enters into the composition of several tinctures, and is scarcely applied to any other use.

Offic. Prep.—V: Aloes cum Canella. *Ed.*

ACORUS CALAMUS. Sweet-scented Flag. *Hexand.*
Monog. Piperitæ. Radix. Indigenus.

THIS root when dried has a slightly aromatic odour, and a bitterish, somewhat pungent taste. It affords by distillation a small quantity of essential oil. Its virtues are merely those of an aromatic; but it is seldom employed.

AMOMUM ZINGIBER. Ginger. *Monand. Monog. Scitamineæ. Radix. East Indies.*

THIS plant is cultivated in the West Indies, whence the dried root is imported. It is in small wrinkled pieces, of a grayish or white colour, having an aromatic odour, and a very pungent, or even acrid taste. The Black Ginger is the root prepared with less care than the White, which, previous to drying, is picked, scraped, and washed.

Ginger yields its active matter completely to alcohol, and in a great measure to water. By distillation it affords a small quantity of essential oil.

This root is frequently employed as a grateful and moderately powerful aromatic, either in combination with other remedies, to promote their efficacy, or obviate symptoms arising from the operation, or by itself as a stimulant, particularly in dyspepsia, flatulence, tympanitis, and gout. Its dose may be ten grains.

Offic. Prep.—Syr: Amom: Zingib. *Ed.*—T: Zingib. *Lond.* Zingib: Condit.

KÆMPFERIA ROTUNDA. Zedoaria. Zedoary. *Monand.*
Monog. Scitamin. Radix. E. Indies.

THIS root is in oblong pieces, of an ash colour; its smell is aromatic; its taste pungent and bitterish. It contains a portion of camphor along with its essential oil.

Its virtues are merely those of an aromatic. It is very seldom used.

SANTALUM ALBUM. Yellow Saunders. *Tetrand. Monog. Bicorn. Lignum. East Indies.*

THIS wood is of a yellowish colour, has a fragrant smell, and a pungent bitterish taste. It has been used as a stimulant and diaphoretic; but it is now banished from practice.

PTEROCARPUS SANTALINUS. Santalum Rubrum. Red Saunders. *Diadelph. Decand. Papilionac. Lignum. India.*

THIS wood has little smell, and scarcely any taste. At one time it was considered as a stimulating or cordial medicine; but it is now used only on account of its deep red colour, which it communicates to alcohol.

MYRISTICA MOSCHATA. *Monoec. Monand. Oleraceæ. Fructûs nucleus; Nux Moschata dictus; Macis; Hujus Oleum fixum. India.*

UNDER the officinal name Myristica, are comprehended Nux Moschata or Nutmeg, and Macis or Mace; the former being the seed or kernel of the fruit, the latter the covering with which it is immediately surrounded.

Nutmegs are round, of a grayish colour, streaked with brown lines, slightly unctuous; they have a strong aromatic flavour, and a pungent taste. They yield their active matter entirely to alcohol: distilled with water, they afford a fragrant essential oil; by expression, a sebaceous oil is obtained from them, retaining their fragrant odour, and part of their pungency.

Nutmeg is used in medicine as a grateful aromatic. It may be given in a dose from five to fifteen grains, and has thus been employed to relieve nausea or vomiting,

or to check diarrhœa. It has been observed to prove narcotic in a large dose.

Mace is a membranous substance, unctuous, of a yellow colour, and having a flavour and taste similar to the nutmeg. It is used for the same purposes.

The expressed oil of nutmeg, which is generally known by the name of Oil of Mace, has been used as an external stimulating application.

Offic. Prep.—Ol: Myrist: Mosch. Sp: Myrist: Mosch.—*Ed.*

CARYOPHYLLUS AROMATICUS. Clove. *Polyand. Monog. Hesperideæ. Flores cum pericarpio immaturo. India.*

CLOVES are the unexpanded flowers, which are dried by fumigating them, and exposing them to the sun. They have a strong aromatic odour, and a pungent taste. They afford to water their flavour principally; to alcohol their taste. By distillation with water, they yield a fragrant essential oil, not very pungent. The oil of cloves commonly met with is rendered acrid by certain additions.

Cloves are amongst the most stimulating of the aromatics; the dose of them does not exceed from five to ten grains. They are employed principally as adjuvants or corrigents to other medicines. The essential oil is used with the same intention, and likewise as a local application to toothach.

Offic. Prep.—Ol: Caryoph: Ar.—*Ed.*

CAPSICUM ANNUUM. Capsicum. Guinea Pepper, or Capsicum. *Pentand. Monog. Solanaceæ. Fructus. East and West Indies.*

THE fruit of this plant is an oblong pod, of an orange colour. Its odour is aromatic and penetrating, but is impaired by drying; its taste remains extremely hot and acrid, the sensation which it excites remaining long impressed on the palate. Its pungency is completely extracted by alcohol, and partly by water.

Capsicum is a very powerful stimulant. As such, it has been given in atonic gout, in palsy and dyspepsia. An infusion of it in vinegar, with the addition of salt, has been used as a gargle in cynanche; but the practice, though it has been found successful in the West Indies, is not without danger. The seeds have been given with advantage in obstinate intermittents, two grains being given at the approach of the cold paroxysm. The dose of the pod is from five to ten grains.

PIPER NIGRUM. Black Pepper. *Diand. Trigyn. Piperitæ. Fruct. India.*

BLACK or Common Culinary Pepper is the unripe fruit of this plant dried in the sun. Its smell is aromatic; its taste pungent. Both are extracted completely by water, partially by alcohol. The essential oil, obtained by distillation, has not the pungency of the pepper, that quality residing in a resinous principle.

Pepper, from its stimulating and aromatic quality, is employed to promote digestion, to relieve nausea, or check vomiting, to remove singultus, and as a remedy in retrocedent gout, and paralysis. Its dose is ten or fifteen grains. Its infusion has been used as a gargle in relaxation of the uvula.

White Pepper is the ripe berries of the same vegetable, freed from the outer covering, and dried in the sun. It is less pungent than the black.

PIPER LONGUM. Long Pepper. *Diand. Trigyn. Piperitæ. Fructus. East Indies.*

THIS is the berry of the plant, gathered before it is fully ripened, and dried in the sun. It is about half an inch long, cylindrical, and indented on the surface. In flavour, taste, and other qualities, it is similar to the black pepper, and may be used for the same purposes.

PIPER CUBEBA. Cubebs. *Diand. Trigyn. Piperitæ.*
Fructus. East Indies.

CUBEBS are the dried fruit of this tree. They have an aromatic odour, and a moderately warm taste. Their virtues are similar to those of the other peppers.

MYRTUS PIMENTA. Piper Jamaicensis. Jamaica Pepper. *Icosand. Monog. Hesperideæ. Baccæ. West Indies.*

THE berries of this tree are pulled before they are ripe, and dried in the sun. Their taste, though pungent, is much less so than that of the peppers; their flavour is fragrant. The flavour resides in the essential oil; the pungency in a resin.

Pimento is used in medicine merely as an aromatic, and principally on account of its flavour.

Offic. Prep.—Aq: Myrt: Pim. Ol: Vol: Myrt: Pim. Sp: Myrt: P. *Ed.*

AMOMUM REPENS. Cardamomum minus. Lesser Cardamom. *Monand. Monogyn. Scitamineæ. Semen. East Indies.*

THE seeds of this plant are dried, and imported in their capsules, by which their flavour is better preserved. Their smell is aromatic; their taste pungent. They are used merely as grateful aromatics, and are frequently combined with bitters.

Offic. Prep.—T: Amom: R. *Ed.*

CARUM CARUI. Caraway. *Pentand. Digyn. Umbellatæ. Semen. Indigenous.*

CARAWAY Seeds have an aromatic flavour, and a warm taste; depending principally on an essential oil, which they contain in considerable quantity. They are used to relieve flatulence, one or two drachms being swallowed

whole; and the essential oil is not unfrequently added to other medicines, to obviate nausea or griping.

Offic. Prep.—Sp: Car: Carv. *Ed.* Ol: Car. *Lond.*

CORIANDRUM SATIVUM. Coriander. *Pentand. Digyn. Umbellatæ. Semen. South of Europe.*

THE seeds of this plant have a much more pleasant odour when dried than when fresh; their taste is moderately warm. Like caraway, they are used as carminative, and likewise to cover the taste and flavour of some medicines, particularly of senna.

PIMPINELLA ANISUM. Anise. *Pentand. Digyn. Umbellat. Semen. Egypt.*

THE seeds of anise have an aromatic odour, and a warm taste, with a share of sweetness. They afford, by distillation with water, a considerable quantity of an essential oil, having a strong flavour, and a sweet taste, without much pungency.

Anise is used as a carminative in dyspepsia, and in the flatulence to which children are subject. A drachm or two of the seeds may be taken, or a few drops of the oil rubbed with sugar.

Offic. Prep.—Ol: Pimpin: Anis. *Ed.*—Sp: Anis. *Lond.*

THE seeds of the following plants have qualities and virtues so very similar to those of the anise or caraway, that they do not require distinct consideration.

ANETHUM FÆNICULUM. Fœniculum dulce. Sweet Fennel. *Pentand. Digyn. Umbell. Semen. Indigenous.*

ANETHUM GRAVEOLENS. Dill. *Pentand. Digyn. Umbell. Semen. Spain and Portugal.*

CUMINUM CYMINUM. Cumin. *Pentand. Digyn. Umbell. Semen. South of Europe.*

ANGELICA ARCHANGELICA. Angelica sativa. Garden Angelica. *Pentand. Digyn. Umbell. Semen; Folia; Radix. North of Europe.*

OF this plant, the root possesses the greatest share of the aromatic quality, though it also belongs to the seeds and leaves.

MENTHA PIPERITA. Mentha Piperitis. Peppermint. *Didynam. Gymnosp. Verticill. Herba. Indigenus.*

OF the different mints, this is the one which has the greatest degree of pungency. It affords an essential oil, rich in the aromatic quality of the herb. It also contains a small portion of camphor.

Peppermint is used as a stimulant and carminative, to obviate nausea or griping, or to relieve the symptoms resulting from flatulence, and very frequently to cover the taste and odour of other medicines. It is used under the forms of the watery infusion, the distilled water, and the essential oil.

Offic. Prep.—Aq: Menth: P. Sp: Menth: P. Ol: Menth: P. *Ed.*

MENTHA VIRIDIS. Mentha sativa. Spearmint. *Didynam. Gymnosperm. Verticill. Herb. Indigenus.*

MENTHA PULEGIUM. Pennyroyal. *Didynam. Gymnosp. Verticill. Herba. Indigenus.*

THESE two mints resemble the peppermint in their general qualities, and are used for the same purposes.

HYSSOPUS OFFICINALIS. Hyssop. *Didynam. Gymnosp. Verticill. Herba. Asia, South and East of Europe.*

THIS plant, nearly allied to the preceding in botanical characters, is possessed of very similar qualities and virtues, and is employed for the purposes for which they are used. It has also been considered as a remedy in catarrh.

CLASS IV.—ASTRINGENTS.

ASTRINGENTS have been usually considered as substances capable of obviating or removing increased evacuations, by their power of constringing or condensing the simple solids, of which the vessels are formed, and this by an action entirely chemical or mechanical, the same as that which they exert on dead animal matter.

Allowing, however, these substances to possess some power of this kind, their effects as remedies cannot be explained merely from its exertion. Increased evacuations cannot be ascribed to mere mechanical laxity of the solids; and their removal cannot be referred to simple condensation of these solids. Neither can it be admitted that active substances may be applied to the system without occasioning changes in the state of the living powers. Many substances, arranged as astringents occasion very considerable alterations in several of the functions; they produce effects too which cannot be solely referred to a condensing power, and therefore, in all the changes they produce, part at least of their operation must be referred to their acting on the powers peculiar to life.

For reasons of this kind, some have denied the existence of such remedies, and have considered those which usually receive the appellation of astringents, merely as stimulants, moderate and permanent in their action; in other words, as *Tonics* of inferior power. But though there be a great analogy between these two classes in their effects, and probably in their mode of operation, there is also a very obvious difference: the most powerful astringents,—that is, substances which immediately restrain excessive evacuations, being much inferior in real tonic power to other substances having little astringency; while there are powerful tonics or medicines capable of removing debility, which do not with any uniformity produce the immediate effects of astringents.

Perhaps astringents may be regarded as moderate, permanent stimulants having their stimulant operation

modified by their power of condensing the animal fibre by a mechanical, or rather a chemical action. That they exert a stimulant operation, is proved by their power of curing intermittent fever, and other diseases of debility; and that they possess a constringing quality is evident, not only from the sensation they excite on the tongue, but is proved by the change they produce in animal matter. If these combined actions be exerted on the fibres of the stomach, the change produced, it is possible, may be propagated by nervous communication to other parts of the system.

The hypothesis of Dr. Darwin, that astringents produce their effects by powerfully promoting absorption, though it serves to explain part of their operation, seems to be refuted by their power of stopping hæmorrhage.

Some narcotics, as opium, have, in certain cases, effects apparently astringent. These are, where increased discharges arise from irritation, in which, by diminishing irritability, they lessen the discharge; but such an operation is altogether different from that of real astringents.

As remedies against disease, astringents may sometimes, from their moderate stimulant operation, be substituted for tonics. They have thus proved successful in the treatment of intermittent fever; and in all cases of debility, they seem to be serviceable, independent of their power of checking debilitating evacuations.

It is, however, for restraining morbid evacuations that astringents are usually employed. In the various kinds of hæmorrhagy, menorrhagia, hæmoptysis, &c. they are frequently employed with advantage, though their power is also often inadequate to stop the discharge. In diarrhœa they diminish the effusion of fluids, and at the same time give tone to the intestinal canal, and thus remove the disease. In the latter stage of dysentery they prove useful by a similar operation. In profuse sweating, and in diabetes, they are frequently sufficiently powerful to lessen the increased discharge; and in those kinds of inflammation, termed passive, and even in certain cases of active inflammation, they are applied with advantage as topical remedies.

It is an obvious caution, that astringents are not to be used to check critical evacuations, unless these proceed to excess.

Astringents may be subdivided into those belonging to the Vegetable, and those belonging to the Mineral kingdom, which differ very considerably from each other in their operation.

ASTRINGENTS.

From the Vegetable Kingdom.

QUERCUS ROBUR.
 QUERCUS CERRIS.
 TORMENTILLA ERECTA.
 POLYGONUM BISTORTA.
 ANCHUSA TINCTORIA.
 HæMATOXYLON CAMPECHIANUM.
 ROSA GALLICA.
 ARBUTUS UVA URSI.
 MIMOSA CATECHU.
 KINO.
 PTEROCARPUS DRACO.
 FICUS INDICA.
 PISTACIA LENTISCUS.

From the Mineral Kingdom.

ACIDUM SULPHURICUM.
 ARGILLA.
 SUPER-SULPHAS ARGILLÆ ET POTASSÆ.
 CALX.—CARBONAS CALCIS.
 PLUMBUM.
 ZINCUM.
 FERRUM.
 CUPRUM.

VEGETABLE ASTRINGENTS.

ASTRINGENCY in vegetables seems to be connected with a certain chemical principle, or at least with some peculiarity of composition, since vegetable astringents uniformly possess certain chemical properties. The astringency is extracted both by water and alcohol, and these infusions strike a black colour with any of the salts of iron, and are capable of corrugating more or less powerfully dead animal matter.

Chemical investigations have accordingly discovered two distinct principles in the vegetable astringents, one or both of which may probably give rise to the astringent property. One of these, the Gallic Acid, is distinguished by its property of striking a deep black colour with the salts of iron: the other the Tanning Principle, or Tannin, is characterized by its strong attraction to animal gelatin, with which it combines, and forms a soft ductile mass, insoluble in water. These may be separated by a solution of animal jelly, which unites with the tannin, and leaves the gallic acid pure.

As both these principles exist in all the stronger vegetable astringents, it is probable that the corrugating property by which the action of these substances as medicines is modified, depends on their combination, especially as, in their action on dead matter, the change produced on the animal fibre by the gallic acid, promotes the combination of that fibre with the tanning principle.

QUERCUS ROBUR. Oak. *Monoec. Polyand. Amentacea.*
Cortex. Indigenus.

THE bark of this tree possesses a large share of astringency, which it yields to water. The infusion contains both the gallic acid and the tanning principle in considerable quantity.

Oak bark has been used as a remedy in hæmorrhage, diarrhœa, and intermittent fever. Its dose in powder is from fifteen to thirty grains. The strong infusion or

decoction of it is employed as an astringent gargle in cynanche, as an injection in leucorrhœa and profuse menorrhagia, and as a fomentation in hæmorrhoids and prolapsus ani.

Offic. Prep.—*Extr: Querc. Dub.*

QUERCUS CERRIS. *Monoec. Polyand. Amentaceæ. Cyniphis nidus. Galla. Galls. South of Europe.*

THE tubercles, termed galls, are found on the branches of this tree. Their production is occasioned by the bark being pierced by an insect of the cynips genus, to deposit its egg. The juice exuding slowly, is inspissated, and hardens. The best galls are heavy, knotted, and of a blue colour. They are nearly entirely soluble in water with the assistance of heat; this soluble active matter consists of tannin in combination with gallic acid, nine-tenths of the former with one-tenth of the latter.

In medicine, galls are employed for the same purposes as oak-bark, and are used under the same forms. An ointment composed of the powdered galls with eight parts of simple ointment, is used as an astringent application to hæmorrhoidal affections.

TORMENTILLA ERECTA. *Tormentil. Icosand. Polygyn. Senticosæ. Radix. Indigenous.*

THE root of tormentil is strongly astringent, with little flavour or bitterness. It has been used in diarrhœa, under the form of decoction, and in intermittent fever, in substance, in the dose of from half a drachm to a drachm.

POLYGONUM BISTORTA. *Bistort. Octand. Trigyn. Oleraceæ. Radix. Indigenous.*

THE root of this plant is a pure and very strong astringent; as such it has been used in diarrhœa and in intermittent fever, in a dose from a scruple to a drachm.

ANCHUSA TINCTORIA. *Alkanet. Pentand. Monogyn.*
Asperifol. Radix. South of Europe.

THE cortical part of the root of this plant has a deep red colour, which is not extracted either by water or alcohol, but readily by expressed oils. It possesses a slight degree of astringency; but it is now only employed to communicate colour to ointments.

HÆMATOXYLON CAMPECHIANUM. *Lignum Campechense. Logwood. Decand. Monog. Lomentaceæ.*
Lignum. South America.

LOGWOOD is of a deep red colour, has scarcely any smell; its taste is sweetish and astringent. Its active matter is extracted by water, and by alcohol; both solutions strike a black colour with the salts of iron. It has been employed in medicine as an astringent, in diarrhœa and chronic dysentery, under the form of the decoction, or the watery extract.

Offic. Prep.—*Extr: Hæmatoxyl: Camp. Ed.*

ROSA GALLICA. *Rosa Rubra. Red Rose. Icosand. Polyg. Senticos. Petala. South of Europe.*

THE petals of this species of rose have a slight degree of astringency, which is most considerable before they are expanded, and it is in this state that they are dried for use. The fresh leaves are made into a conserve with sugar, and the infusion of the dried leaves, slightly acidulated, forms a pleasant astringent gargle.

Offic. Prep.—*Inf: Ros: Gall. Cons: Ros: R. Syr: Rosæ. Ed.*—*Mel Rosæ. Lond.*

ARBUTUS UVA URSI. *Bear's Whortle-Berry. Decand. Monog. Bicorn. Folia. Europe, America.*

THE leaves of this plant have a bitter astringent taste, without any odour. Their watery infusion strikes a deep black colour with the salts of iron.

From its astringency, *Uva Ursi* has been employed in menorrhagia, and other fluxes, but more particularly in cystirrhœa, calculus, diabetes, and ulcerations of the urinary organs, in some of which affections its efficacy is greater than has of late been allowed. Its dose is half a drachm of the powdered leaves, twice or thrice a-day.

MIMOSA CATECHU. Terra Japonica. Catechu, or Japan Earth. *Polygam. Monœc. Lomentac. Ligni Extractum. East Indies.*

THIS substance is obtained by boiling the interior wood of the above tree with water, the decoction is poured off and evaporated, and the tenacious extract thus obtained, is dried by exposure to the air and sun. It is in small pieces, of a yellow or brown colour; it has a mucilaginous astringent taste, and dissolves entirely in the mouth. It is soluble in water, the impurities excepted, and is nearly entirely soluble in alkohol. Its solution in water, or in proof spirit, yields a copious precipitate with animal gelatin, and strikes a black colour with salts of iron. It consists of tannin, extractive matter, and mucilage.

Catechu is employed as an astringent, principally in diarrhœa, and is one of those most effectual, and at the same time most convenient for exhibition. Its dose may be from fifteen to thirty grains. It is also used under the form of infusion or tincture; and externally as a local astringent application in affections of the gums and mouth.

Offic. Prep.—Flect: Catech. Inf: Mim: Cat. T: Mim: Cat. *Ed.*

KINO.

THIS substance is the produce of a tree a native of Africa; the botanical characters of which have not been ascertained. It is of a dark-red colour, and has an astringent taste, with a degree of bitterness. It is more resinous than catechu, and is therefore less soluble in water.

Its solution in water, as well as that in alcohol, strikes a deep purple colour with sulphat of iron, the latter even more so than the former. Its gallic acid seems therefore to be combined with its resinous part. It yields a precipitate with animal gelatin, but scarcely so copious as that from catechu.

Kino is employed as an astringent in the same cases as catechu, to which it is considered as superior in astringent power. Its dose is from twenty to thirty grains.

Offic. Prep.—T: Kino. *Ed.*

PTEROCARPUS DRACO. Sanguis Draconis. Dragon's Blood. *Diadelph. Decand. Papilionaceæ. Resina. South America.*

THIS resin has a dark-red colour, and a slightly astringent taste. It is considered as much inferior to the catechu, and is now scarcely ever employed in medicine. Perhaps it is undervalued, as, from Proust's experiments, it appears to contain much tannin.

LACCA. Lac. Ficus Indica. *Polygam. Diæc. Resina. East Indies.*

THIS resinous matter is the exudation from the above tree, occasioned by an insect piercing it to collect it. It is imported under the varieties of Seed and Shell Lac, which differ little but in form: Both have been supposed to be astringents, and have sometimes been used under the form of tincture, as an application to spongy gums.

PISTACIA LENTISCUS. Mastiche. Mastich. *Diæc. Pentan. Amentac. Resina. South of Europe.*

THIS resin is obtained by exudation. It has scarcely any smell or taste. It was formerly employed as a mild astringent in leucorrhœa and gleet, but is now nearly discarded from practice.

MINERAL ASTRINGENTS.

OF these, the principal are the Mineral Acids, especially the Sulphuric, and the combinations it forms with some of the metals and earths.

ACIDUM SULPHURICUM. Sulphuric Acid. Acidum Vitriolicum. Vitriolic Acid.

THIS acid is formed from the combination of sulphur with oxygen to the point of saturation. It is obtained by the combustion of sulphur. The sulphur, reduced to powder, is mixed with from one-eighth to one-tenth of its weight of nitrat of potash, by which its combustion, when begun, can be continued without the free access of atmospheric air. It is thus burnt in a large leaden chamber; the sulphuric acid which is slowly formed, is absorbed by water placed in the bottom of the chamber; the acid liquor is concentrated, by exposing it to heat in glass retorts, and the pure sulphuric acid is thus obtained. It is of a thick consistence, and has an apparent unctuousity; its specific gravity is 1850; when pure, it is colourless and transparent. It is highly corrosive, and possesses all the general acid properties in an eminent degree.

As a medicine, this acid is employed as an astringent and refrigerant. Its astringency is considered as superior to that of any other acid. From this virtue it is used in hæmoptysis, menorrhagia, diabetes, hectic, and dyspepsia. In its concentrated state its dose can scarcely be measured. In the Pharmacopœias, therefore, it is ordered to be kept diluted. The Acidum Sulphuricum Dilutum consists of one part of the strong acid with seven of water; it is given in a dose from ten to thirty drops. The Acidum Sulphuricum Aromaticum, consists of the acid diluted with alcohol impregnated with aromatics, and is given in a similar dose. From its astringency, this acid is generally added to gargles, which are employed to check salivation, or relieve relaxation of the uvula.

Externally mixed with lard, in the proportion of half a drachm to an ounce, it has been used with advantage in psora, and it has been given internally in the same disease.

Offic. Prep.—Acid: Sulph: Dil. Acid: Sulph: Aromat. *Ed.*

ARGILLA. Argil.

SOME of the combinations of this earth are employed as astringents, and nearly all its saline combinations possess an astringent power.

The Boles, of which the Armenian Bole (*Bolus Armena*) is the chief, are argillaceous earths, impregnated with oxyd of iron; they were at one time employed as astringents, but are entirely inert, and are now expunged from practice.

SUPER-SULPHAS ARGILLÆ ET POTASSÆ. Alumen. Alum.

THIS is a salt composed chiefly of argillaceous earth and sulphuric acid, the acid being in excess. It likewise always contains a smaller portion of potash, and frequently of ammonia. It is found native, or is prepared by exposing alum ores, which are native compounds of argillaceous earth and sulphur, to atmospheric air; the sulphur absorbing oxygen, forms sulphuric acid, which unites with the argillaceous earth, and the formation of the alum is completed by the addition of potash or ammonia. It is then obtained pure by crystallization.

This salt is in large transparent masses; it has a styptic taste, with a degree of sweetness. From the excess of its acid it reddens the vegetable colours. It is soluble in eighteen parts of cold, and in less than two of boiling water. The variety termed Roche or Rock Alum (*Alumen rupeum*) has a reddish colour from the presence of a portion of iron, but its other properties are the same as those of common Alum.

Alum, from its astringent power, is employed to check hæmorrhagies and serous evacuations: it is thus given in

menorrhagia, leucorrhœa, and diabetes. It has likewise been used, though less frequently, in intermittent fever, malignant small-pox, and colica pictonum. Its dose is from five to fifteen grains. The addition of an aromatic is generally necessary, to prevent it from exciting nausea, when it is given in the solid form. The best form of administering it, however, is that of the Alum Whey (*Serum Aluminosum*), prepared by adding two drachms of powdered alum to a pint of hot milk; the dose of this is three or four ounces. Externally alum is frequently used as the basis of astringent gargles, and of injections used in gleet.

Offic. Prep.—Sulph: Alum: Exs. P: Sulph: Alum: C. *Ed.*—Alum: Purific. Catap: Alum. Aq: Alum: C. *Lond.*

CALX. Lime. Calx Viva. Quicklime.

LIME is a simple earth, found abundantly in nature, in several states of combination. It is obtained by exposing the native compounds of it with carbonic acid to a moderately strong heat. The acid is expelled, and the lime remains pure. It is soluble in water; the solution, which is known by the name of Lime Water (*Aqua Calcis*) has a styptic taste. As an astringent it has been employed in diabetes, and in diarrhœa. The dose is one or two pounds in the course of the day.

Offic. Prep.—Aq: Calc. Ol: Lini cum Calce. *Edin.*

CARBONAS CALCIS. Carbonat of Lime.

THE various kinds of carbonat of lime, Chalk (*Creta Alba*), Crabs Claws (*Chelæ Cancrorum*), Oyster Shells (*Testæ Ostreorum*), are to be afterwards noticed as antacids; as although they are used in diarrhœa, they evidently prove useful, not by any real astringent power, but by correcting the acidity which so frequently occasions or aggravates that disease.

Offic. Prep.—Potio Carb: Calc. Pulv: Carb: Calc: C. Troch: Carb: C. *Ed.*—Pulv: Chel: Canc: C. Pulv: Cret: Comp: cum Opio. *Lond.*

LEAD, ZINC, IRON and COPPER, must in strict propriety be ranked as astringents, since some of their preparations are used on account of their styptic power.

PLUMBUM. Lead.

THIS metal, when rendered active on the system by oxydation, or combination with acids, produces very deleterious effects. Its mode of operation is not easily explained, but in part it appears to be that of an astringent, and as such it is used externally in several affections, and has even been administered internally. The preparations of it that are employed are the White Oxyd, or rather sub-carbonat (Cerussa), and the salt formed by its union with the acetous acid, the Acetis Plumbi.

CERUSSA. Ceruse. White Lead.

THIS is the metal oxydated by being exposed to the vapour of acetous acid; it appears also to be combined with carbonic acid. It is used as an external application to superficial inflammation, in the form of powder or ointment.

Offic. Prep.—Ung: Oxid: Plumb: A. *Ed.*—P: Ceruss: Comp. *Lond.*

ACETIS PLUMBI. Cerussa Acetata. Saccharum Saturni. Acetite of Lead. Sugar of Lead.

THIS salt is prepared by saturating the ceruse with acetous acid, by boiling them together. By evaporating the solution, a confusedly crystallized mass is obtained. Like the other preparations of lead it is a violent poison. It has been used internally, however, as a styptic in profuse menorrhagia, in a dose of half a grain repeated every half hour. But the practice is scarcely admissible. Externally it is very freely employed dissolved in water, as

an application to superficial inflammation, as an injection in gonorrhœa, and a collyrium in ophthalmia.

Offic. Prep.—Ung: Acet: Plumb. *Ed.*

ZINCUM. Zinc.

The combination of the oxyd of this metal with sulphuric acid, the Sulphat of Zinc (Sulphas Zinci), is the preparation of it that is employed as an astringent. Internally it has sometimes been given in dysentery in a dose of two or three grains twice or thrice a-day. Externally it is very frequently used as the basis of astringent injections in gonorrhœa, and collyria in ophthalmia, in the proportion of two or three grains to one ounce of water.

Offic. Prep.—Sol: Sulph: Zinc. *Ed.*—Aq: Zinc: Vit: cum Camph. *Lond.*

The Acetite of Zinc (Acetis Zinci) possesses similar powers, and is used for the same purposes.

FERRUM. Iron.

THE Sulphat of Iron (Sulphas Ferri) is the preparation of this metal, which seems more particularly to have an astringent quality. It is rather used, however, as a tonic than as an astringent.

CUPRUM. Copper.

THE saline preparations of this metal shew a considerable degree of astringency, along with a corrosive quality. The salt resulting from its union with sulphuric acid (Sulphas Cupri), is the most active. A strong styptic solution is prepared by dissolving a portion of it with alum in water, and adding sulphuric acid, which has been in use to stop hæmorrhage from wounds.

Offic. Prep.—Sol: Sulph: Cupr: C. *Ed.*

THE Acetite of Copper or Verdigrise (Acetis Cupri vel Ærugo Æris) has likewise been applied to the eyes

in certain forms of ophthalmia, in the form of solution or ointment, and seems to prove useful by its astringent power.

LOCAL STIMULANTS.

CLASS V.—EMETICS.

EMETICS are substances capable of exciting vomiting, independent of any effect arising from the mere quantity of matter introduced into the stomach, or of any nauseous taste or flavour.

The effects of an emetic, are an uneasy sensation in the stomach, with nausea and vomiting. While the nausea only is present, the pulse is feeble, quick and irregular, and the countenance pale: during vomiting the face is flushed, the pulse is quicker, and it remains so during the intervals of vomiting. When the operation of vomiting has ceased, the nausea goes off gradually; the patient remains languid, and often inclined to sleep; the pulse is weak, but becomes gradually slow and full, and the skin is commonly moist.

The general nature of vomiting is sufficiently evident. The peristaltic motion of the stomach is inverted, the diaphragm and abdominal muscles are called into action by association, and the pylorus being contracted, the contents of the stomach are forcibly discharged. The peristaltic motion of the upper part of the intestinal canal is likewise frequently inverted.

How this peristaltic motion is thus inverted, it is difficult to explain. The substances which have this effect no doubt possess a stimulant power, but the effect is by no means produced in proportion to the degree of stimulant operation exerted on the stomach, and it has not been explained how such an operation can invert the usual motion.

Dr. Darwin considers vomiting as the effect, not of increased action from the operation of a stimulus, but of diminished action, arising from the disagreeable sensation of nausea. This being induced, the usual motion is gradually lessened, stopt, and is at length inverted, which gives rise to the phenomena of vomiting.

The susceptibility of vomiting is very different in different individuals, and is often considerably varied by disease.

Though nausea generally accompanies vomiting, this is scarcely a necessary connexion: some emetics acting without occasioning much nausea, while others induce it in a much greater degree than is proportioned to their emetic power.

The feeble and low pulse which accompanies vomiting, has been ascribed to direct association between the motions of the stomach and those of the heart, or it may be owing to the nausea excited, which being a disagreeable sensation, is equivalent to an abstraction of stimulus.

It is supposed also, that a sympathy exists between the stomach and the surface of the body, so that the state of the vessels of the one part is communicated to the vessels of the other. Hence vomiting is frequently followed by diaphoresis.

Emetics powerfully promote absorption.

They often occasion increased evacuation by the intestinal canal, more especially when they have been given in too small a dose to excite vomiting, an effect arising from their stimulating power.

Lastly, several of the effects of vomiting have been ascribed to the agitation of the body, and to the compression of the viscera, by the action of the diaphragm and abdominal muscles.

Emetics are employed in many diseases.

When any morbid affection depends upon, or is connected with over-distention of the stomach, or the presence of acrid indigestible matters, vomiting gives speedy relief. Hence its utility in impaired appetite; acidity in the stomach; in intoxication, and where poisons have been swallowed.

From the pressure of the abdominal viscera in vomiting, emetics have been considered as serviceable in jaundice arising from biliary calculi obstructing the hepatic ducts.

The expectorant power of emetics, and their utility in catarrh and phthisis, have been ascribed to a similar pressure extended to the thoracic viscera.

In the different varieties of febrile affections, much advantage is derived from exciting vomiting, especially in the very commencement of the disease. In high inflammatory fever, it is considered as dangerous; and in the advanced stage of typhus it is prejudicial.

Emetics given in such doses as only to excite nausea, have been found useful in restraining hæmorrhage.

Different species of dropsy have been cured by vomiting, from its having excited absorption. To the same effect, perhaps, is owing the dispersion of swelled testicle, bubo, and other swellings, which has occasionally resulted from this operation.

The operation of vomiting is dangerous or hurtful in the following cases: where there is determination of blood to the head, especially in plethoric habits; in visceral inflammation; in the advanced stage of pregnancy; in hernia, and prolapsus uteri, and wherever there exists extreme general debility.

The frequent use of emetics weakens the tone of the stomach.

An emetic should always be administered in the fluid form. Its operation may be promoted by drinking any tepid diluent or bitter infusion.

The individual emetics may be arranged under those derived from the Vegetable, and those from the Mineral kingdom.

EMETICS.

From the Vegetable Kingdom.

CALLICOCCA IPECACUANHA.

SCILLA MARITIMA.

ANTHEMIS NOBILIS.

SINAPIS ALBA.

ASARUM EUROPÆUM.

NICOTIANA TABACUM.

From the Mineral Kingdom.

ANTIMONIUM.

SULPHAS ZINCI.

SULPHAS CUPRI.

SUB-ACETIS CUPRI.

AMMONIA.

HYDRO-SULPHURETUM AMMONIÆ.

EMETICS FROM THE VEGETABLE KINGDOM.

IPECACUANHA. Ipecacuan. Callicocca Ipecacuanha.
 Cephaëlis Ipecacuanha of Wildenow. *Pentand. Mono-*
gyn. Aggregatæ. Radix. South America.

OF this root several varieties have been imported, but the ash-coloured, or Peruvian ipecacuan, is the best, and is the one commonly met with. It is in small wrinkled pieces, externally brown, internally whiter; has a faint smell, and a bitter, slightly acrid taste. It contains both a resinous and gummy matter. It is generally stated, that its emetic power, and, indeed its principal virtues, reside in the former, though Dr. Irving has affirmed that they depend on its gum. Its active matter is completely

extracted by alcohol, proof-spirit or wine. Vinegar likewise dissolves it, but at the same time greatly weakens its power. By decoction with water, its activity is greatly impaired, though the water distilled from it has scarcely any emetic power. It is even injured by being kept long exposed in the state of powder to the air and light.

Ipecacuan is the mildest of those emetics, which are at the same time certain in their operation. It merely evacuates the contents of the stomach, without exciting violent vomiting, or extending its action beyond the stomach; and is hence adapted to many cases where violent vomiting would be useless or improper. The medium dose of it as an emetic is fifteen grains, though twenty or thirty may be taken with perfect safety. Ipecacuan is likewise employed with other intentions than as an emetic. It was at one time much celebrated as a remedy in dysentery, given either in such a dose as to produce full vomiting, or rather in the quantity of two or three grains repeated every three or four hours, till it occasioned vomiting, diaphoresis, or purging. It has been given in a similar mode in obstinate diarrhoea. In spasmodic asthma, it is exhibited in a full dose to relieve the paroxysm; and in a dose of three or four grains continued every morning for some weeks to prevent the return of the disease. In hæmorrhagies it is given in nauseating doses, the nausea diminishing the force of the circulation. Combined with opium it forms a very powerful sudorific.

Offic. Prep.—P. Ipecac. et Opii. Vin. Ipecac. *Edin.*

SCILLA MARITIMA. Squill. *Hexand. Monogyn. Liliaceæ.*
Radix. South of Europe.

SQUILL is the bulbous root of a plant growing on the sandy shores of Spain and Italy. It has little smell; its taste is bitter and acrid, and it is capable of inflaming the skin; its acrimony is lessened by drying; its bitterness is little impaired. In drying it loses about four-fifths of its weight. Its active matter is extracted by water, alcohol, and acetous acid. The latter is the solvent commonly employed, as it best covers its nauseous taste.

Squill, when given in a sufficient dose, excites vomiting, though it is seldom used with that intention. The vinegar of Squill acts as an emetic in a dose of two or three drachms, as does the syrup when given in double that quantity; and either of them is sometimes given in pertussis. This root is, however, much more used as a diuretic and expectorant; uses of it which are afterwards to be noticed.

Offic. Prep.—Acet: Scill: Mar. Pil: Scill. Syr: Scill: Mar. *Ed.*—Cons: Scill. Tinct: Scill. *Lond.*

ANTHEMIS NOBILIS. Chamomile. (See p. 112.)

A STRONG infusion of chamomile flowers in tepid water excites vomiting, and a weaker infusion is often employed to quicken the action of other emetics.

SINAPIS ALBA. Mustard. *Tetradyn. Siliq. Siliquosæ. Semen. Indigenous.*

MUSTARD-SEED in powder, given in the dose of a tea-spoonful, mixed with water, operates speedily as an emetic. From its stimulant quality, it has been recommended in preference to other emetics in apoplexy and paralytic affections, and has sometimes been found to excite vomiting, when these had failed.

ASARUM EUROPÆUM. Asarabacca. *Dodecand. Monogyn. Sarmentac. Folia. Indigenous.*

THE leaves and root of this plant, prior to the introduction of ipecacuan, were frequently employed on account of their emetic power; the dose of the dried leaves was twenty grains: of the dried root, ten grains. As they were occasionally violent in their operation, they have fallen into disuse.

NICOTIANA TABACUM. Tobacco. (See p. 82.)

THE leaves of this plant excite severe nausea and vomiting even in a small dose; and the same effects have followed from their external application to the region of the stomach. Tobacco is, however, rarely employed as an emetic.

EMETICS FROM THE MINERAL KINGDOM.

ANTIMONIUM. Stibium. Antimony.

THIS metal in its various states of preparation possesses a general evacuant power, and furnishes some of our most powerful cathartics, diaphoretics, and expectorants. All its preparations in larger doses act as emetics, and several of them are in common use for that purpose. It is therefore under this class that its general history may be introduced.

Antimony, in the modern nomenclature, is the name given to a peculiar metal. This metal is found in nature, most abundantly combined with sulphur; and to this ore the name of Antimony was once generally given. To distinguish it from the pure metal, it is named Crude Antimony, or more properly Native Sulphuret of Antimony, the simple name Antimonium or Stibium being appropriated to the metal itself.

The native sulphuret is of a gray or blue colour; has a shining surface, and striated texture. To free it from the earthy matters with which it is mixed, when dug from the earth, it is fused. Its lustre is greater the more completely it is purified. The proportions of its principles are various; sometimes they are nearly equal; in other specimens the quantity of metal is larger.

The pure metal, obtained from the ore, is of a silvery white colour, and plated texture, moderately hard, and very brittle; easily fusible, and even volatilized by a heat not very intense; oxydated by exposure to the air at a

temperature moderately increased; and when oxydated, capable of combining with the greater number of the acids.

The preparations of antimony, though of very different degrees of strength, still retain the same general mode of action, and possess of course the same medicinal virtues. They do not exert any general stimulant operation, but are always directed in their action to particular parts, so as to occasion some sensible evacuation.

The principal general medicinal application of antimony has been for the cure of febrile affections. It is given so as to induce vomiting or purging, diaphoresis being also promoted; and exhibited in this manner in the commencement of the disease, it has been considered as capable of cutting short its progress. In the latter stage of fever, where debility prevails, its use is inadmissible. Its efficacy has in general been ascribed to the evacuation it occasions: others have considered it, apparently with little reason, as exerting an action specific or peculiar in itself, and not explicable on the known effects it produces.

Antimonials have been found to have similar good effects in intermittent as in continued fever, as well as in several of the phlegmasiæ and exanthemata, and even in several of the profluvia.

As an emetic, antimony is distinguished for the certainty, extent, and permanence of its operation. The action it excites in the stomach is both more forcible, and continues for a longer time, than that from other emetics, and hence it produces more complete evacuation, and occasions in a greater degree all those effects which result from the action of vomiting. Its action is also less local. It is very generally extended to the intestinal canal, so as to produce purging, and very frequently to the surface of the body, so as to occasion diaphoresis or sweat.

Of the preparations of antimony, it is necessary to take only a very cursory view, as they are to be more fully noticed in another part of the work. They may be arranged under three divisions: those in which the metal is combined with sulphur; those in which it is oxydated;

and those in which it is brought into a saline state by combination with acids.

Of the first, the Levigated Antimony (*Antimonium Præparatum*), which is merely the native sulphuret reduced to a state of mechanical division, is the only preparation. It has been given as a diaphoretic, especially in chronic rheumatism, in a dose from fifteen grains to one drachm, but it is very inert.

The oxyds of antimony differ in their qualities according to the degree of oxygenation. From the late researches of Proust, it appears, that the metal is capable of two degrees, being in one combined with 23 parts of oxygen in the 100; in the other, with 30 parts. But these oxyds are capable of combining with proportions of sulphuret of antimony; and combinations of this kind constitute several well known antimonial preparations. As medicines, the oxyds of antimony are uncertain in their operation, from varying in their composition, and from being influenced by the state of the stomach with regard to acidity.

Oxydum Antimonii per Nitratem Potassæ, formerly *Crocus Antimonii*, is prepared by deflagrating sulphuret of antimony with an equal part of nitrat of potash. The greater part of the sulphur is oxydated and dissipated; a brown oxyd of antimony remains, combined, according to Proust, with one-fourth sulphuret of antimony. It acts as a diaphoretic, emetic, or cathartic, but is so uncertain in its effects that it is never prescribed. It serves for the preparation of some other antimonials.

Oxydum Antimonii cum Sulphure Vitrificatum, formerly *Vitrum Antimonii*.—This is prepared by exposing sulphuret of antimony to atmospheric air at a high temperature. The sulphur is dissipated, and the antimony oxydated and vitrified. It still retains combined with it a portion of sulphur, or, according to Proust, one-ninth of sulphuret of antimony. It also is so uncertain in its operation, and occasionally so violent, that it cannot be medicinally employed.

Oxydum Antimonii vitrificatum cum Cera.—This is prepared by exposing the powder of the preceding pre-

paration with an eighth part of wax to heat. It is thus rendered milder, probably by part of its oxygen being abstracted. Though once highly celebrated in dysentery, in a dose of from five to fifteen grains, it has been long in disuse.

Oxydum Antimonii Album, formerly Antimonium Calcinatum.—This is prepared by deflagrating sulphuret of antimony with a large quantity of nitrat of potash, (three times its weight), so that the metal is saturated with oxygen. It is comparatively inactive, and does not excite vomiting in a dose less than a scruple or half a drachm. In smaller doses, it has been used as a diaphoretic.

Oxydum Antimonii cum Phosphate Calcis, formerly Pulvis Antimonialis.—This is prepared by exposing to heat sulphuret of antimony and bone-shavings. The result is oxyd of antimony and phosphat of lime, in the proportion of 57 of the former and 43 of the latter, part of the oxyd being in a vitrified state. It is similar in composition to the celebrated James's Powder, for which it is designed as a substitute. It acts as a diaphoretic, emetic, and cathartic, and is given at the commencement of febrile affections, to cut short their progress, in a dose of five or eight grains, repeated, if necessary, after an interval of five or six hours.

Sulphuretum Antimonii Præcipitatum, formerly Sulphur Auratum Antimonii.—This is prepared by boiling sulphuret of antimony with a solution of potash, and adding to the filtered liquor, sulphuric acid: it is a combination of oxyd of antimony with sulphurated hydrogen and sulphur. In a dose from five to ten grains, it produces the usual effects of antimonials, and has been employed as a remedy in fever; but from the uncertainty of its operation, it is discarded from practice.

The preparation termed Kermes Mineral, and which is merely the precipitate that subsides on cooling from the liquor formed by the boiling a solution of potash on sulphuret of antimony, is similar to the preceding, being a combination of oxyd of antimony with sulphurated hydrogen. It is used in a similar dose.

Of the saline combinations of antimony, the only ones medicinally employed are the Muriat and the Tartrite.

The Muriat (*Murias Antimonii*) is so acrid that it can only be used externally as an escharotic.

Tartris Antimonii cum Potassa, formerly *Antimonium Tartarisatum vel Tartarum Emeticum*.—It is obtained by boiling an oxyd of antimony with acidulous tartrite of potash; the excess of tartarous acid dissolves the oxyd, and a triple salt is obtained by crystallization. It is the most useful of all the antimonial preparations. Its action is not dependent on the state of the stomach, and being soluble in water, its dose is easily managed, while it also operates more speedily. In a dose of a grain and a half or two grains, it generally acts powerfully as an emetic, and is employed whenever we wish to obtain the effects which result from full vomiting. In a smaller dose, it acts as a diaphoretic, expectorant, and cathartic.

Vinum Antimonii Tartarizati. This is merely a solution of the preceding preparation in white wine, and is designed to afford a pleasant form for its exhibition. One ounce prepared according to the *Edinburgh Pharmacopœia* contains two grains, and is a dose. That according to the formula given by the *London College* is double this strength.

SULPHAS ZINCI. Sulphat of Zinc.

THIS salt is sometimes used as an emetic, on account of the suddenness of its operation, especially where poisonous substances have been received into the stomach. It is given in a dose from five grains to twenty, dissolved in water.

SULPHAS CUPRI. Sulphat of Copper.

THIS preparation of Copper, in a dose from one to five grains, dissolved in water, has been used as an emetic, particularly in incipient phthisis; but it seems in no respect preferable to more safe emetics. The same may

be said of the Acetite of Copper (*Acetis Cupri*) which has been given for the same purpose, in a dose of one or two grains dissolved in an ounce of water.

THE solution of AMMONIA in water (*Aqua Ammoniaë*) excites vomiting, a tea-spoonful being given in a cupful of tepid water. It operates without violence, but its acrimony renders it unpleasant in swallowing.

Hydro-Sulphuretum Ammoniaë. Hydro-Sulphuret of Ammonia.—This combination is obtained by passing a stream of sulphurated hydrogen through a solution of ammonia in water. It acts with energy on the stomach, inducing nausea in a small dose, and being capable of occasioning vomiting. It is scarcely used as an emetic, but rather as a nauseating remedy. The principal application of it is in diabetes, with the view of reducing the morbid appetite and increased action of the stomach. It is given in a dose of from five to fifteen drops, twice a-day.

CLASS VI.—CATHARTICS.

CATHARTICS are medicines which quicken or increase the evacuation from the intestines, or which, when given in a sufficient dose, excite purging. They evidently act by augmenting the natural peristaltic motion, from their stimulant operation on the moving fibres of the intestines, whence the contents of the canal are more quickly propelled. The greater number, or perhaps all of them, seem likewise to stimulate the extremities of the exhalant vessels terminating on the internal surface of the intestines, and hence the evacuations they occasion are not only more frequent, but thinner, and more copious.

Besides these immediate actions, the stimulant operation of cathartics appears to be more or less extended to neighbouring organs, and hence they promote the secretion and discharge of the bile, and other fluids usually poured into the intestinal canal. It is also exerted on the stomach, so as to occasion a more quick evacuation of the contents of that organ by the pylorus.

Besides the differences between individual cathartics in quickness, slowness, or other circumstances attending their operation, there is a general difference in the mode in which they act, from which they may be, and usually have been ranked under two divisions. Some operate mildly, without exciting any general affection of the system, without even perceptibly stimulating the vessels of the intestines, and hence they merely evacuate the contents of the canal. Others are much more powerful stimulants: they always occasion an influx of fluids from the exhalant vessels, and neighbouring secreting organs: they extend their stimulus to the system in general, and if taken in too large a dose, excite inflammation on the surface of the intestines. The former are distinguished by the title of Laxatives; the latter are termed Purgatives, and the stronger of them Drastic Purgatives.

Cathartics, as medicines, are capable of fulfilling various indications.

Where there exists a morbid retention of the contents of the stomach, where these contents are acrid, or where extraneous bodies are present, they are calculated by their evacuating power to relieve the symptoms arising from these affections, and hence their utility in constipation, colic, dysentery, and a variety of febrile affections. Partly by exciting the intestines to action, and partly by extending their stimulus to the other abdominal viscera, cathartics are of service in dyspepsia, hypochondriasis, amenorrhœa, jaundice, and visceral obstructions.

By their power of stimulating the exhalant vessels, on the internal surface of the intestinal canal, and causing a larger portion of fluid to be poured out, cathartics are capable of producing a diminution of the fluids with respect to the general system, and of course cause an abstraction of stimulus. Hence purging is a principal part of what is termed the Antiphlogistic Regimen, and is employed as a remedy of much power in highly inflammatory diseases.

From the same power of causing effusion of fluid, is to be explained the utility of cathartics in the various

species of dropsy. A balance is preserved in the system between exhalation and absorption, so that when one is increased, the other is so also. The increased secretion and discharge of serous fluid, which cathartics occasion, causes an increased absorption; whence the affused fluid in dropsy is frequently taken up and removed.

Partly by the serous evacuation which cathartics occasion, and partly by the derivation of blood they make from the head, they are highly useful in the prevention and cure of apoplexy, all comatose affections, mania, phrenitis and headach.

By a change in the distribution of the blood, it has been supposed that purging determines from the surface of the body; and hence in a great measure has been explained its utility in small-pox and some other eruptive diseases.

The administration of cathartics is rendered improper by inflammation of the stomach or intestines, or tendency to it, and by much debility. Several cautions are likewise requisite in their exhibition. The nausea or griping they frequently produce, may be obviated by the addition of an aromatic, or by giving them in divided doses. The more powerful cathartics should always be given in the latter mode; and in general they irritate less when given diffused in a fluid than when given in a solid form.

The different cathartics may be considered under the two divisions of Laxatives and Purgatives: the former being mild in their operation, and merely evacuating the contents of the intestines; the latter being more powerful, and even extending their stimulant operation to the neighbouring parts.

CATHARTICS.

A.—*Laxatives.*

MANNA.
CASSIA FISTULA.
TAMARINDUS INDICA.
RICINUS COMMUNIS.
SULPHUR.
MAGNESIA.

B.—*Purgatives.*

CASSIA SENNA.
RHEUM PALMATUM.
CONVOLVULUS JALAPA.
HELLEBORUS NIGER.
BRYONIA ALBA.
CUCUMIS COLOCYNTHIS.
MOMORDICA ELATERIUM.
RHAMNUS CATHARTICUS.
ALOE PERFOLIATA.
CONVOLVULUS SCAMMONIA.
CAMBOGIA GUTTA.
SUB-MURIAS HYDRARGYRI.
SULPHAS MAGNESIÆ.
SULPHAS SODÆ.
SULPHAS POTASSÆ.
SUPER-TARTRIS POTASSÆ.
TARTRIS POTASSÆ.
TARTRIS POTASSÆ ET SODÆ.
PHOSPHAS SODÆ.

MURIAS SODÆ.
TEREBINTHINA VENETA.
NICOTIANA TABACUM.

LAXATIVES.

MANNA. Manna. Fraxinus Ornus. *Polygam. Diœc. Ascyroid. Succus concretus. South of Europe.*

THIS substance, though afforded by several vegetables, is usually obtained from different species of the ash-tree, which are cultivated in Sicily and Calabria. It is procured by spontaneous exudation, but more copiously by incisions made in the bark of the trunk. The juice, which exudes, soon becomes concrete. When it exudes slowly, the manna is more dry and white, forming Flake Manna. When the exudation is more copious, the juice is of a darker colour, and concretes into a soft unctuous-like mass, less pure than the other.

Manna has a very sweet taste, and possesses the general chemical properties of saccharine matter; it is entirely soluble in water and alcohol. Although sugar in its unrefined state proves laxative, manna is so in a greater degree.

The dose of manna, as a laxative, is from one to two ounces to an adult. On account of its sweetness, it is frequently given to children, or is combined with other purgatives. Though mild in its operation, it is apt to produce flatulence and griping.

Offic. Prep.—Syrup: Mannæ. *Dub.*

CASSIA FISTULA. Purging Cassia, or Cassia in pods. *Decand. Monog. Lomentaceæ. Fructus; Pulpa Fructûs. Egypt; E. and W. Indies.*

THE fruit of this tree is in pods, about an inch in diameter, and ten or twelve in length. The pulp they contain is of a black colour, and has a sweet taste, with a slight degree of acidity. It is extracted by boiling the bruised pods in water, and evaporating the decoction. It is soluble in water. According to Vauquelin's analysis of it, it contains, besides the fibrous part, gluten, gelatin, gum, and saccharine matter.

This pulp proves gently laxative in a dose of four or six drachms; in the large dose necessary to occasion purging, it is apt to induce nausea or griping. It is an ingredient in the Electuarius Sennæ.

Offic. Prep.—Elect: Cass: Fist. *Ed.*

TAMARINDUS INDICA. Tamarind. *Monadelph. Triand. Lomentaceæ. Fructus conditus. East and West Indies, America, Arabia.*

THE pod of this tree includes several large hard beans, with a brown viscid pulp, very acid. This pulp, mixed with the seeds and small fibres, and with a quantity of unrefined sugar, forms the Tamarinds of the shops. Vauquelin found it to contain, besides the sugar mixed with it, citric and malic acids, acidulous tartarite of potash, free tartarous acid, gelatin, mucilage, and fibrous matter.

The pulp of tamarinds, besides its virtues as an acid, proves laxative, when taken to the extent of an ounce, or an ounce and a half. It is generally added to other cathartics, which are given in the form of infusion, with the views of promoting their operation, and covering their taste. It is an ingredient in the Elect. Sennæ.

Offic. Prep.—Inf: Tam: Ind: cum Cass: Sen. *Ed.*

THERE are some other sweet fruits which have a laxative quality, as the Fig (*Ficus Carica*) and the Prune (*Prunus Domestica*). These are sometimes used in domestic practice, and are ingredients in the Elect. Sennæ.

RICINUS COMMUNIS. Palma Christi. *Monæc. Monadelph. Tricoc. Oleum; Semen. W. Indies.*

AN oil is obtained by expression or decoction from the nuts of this tree, which is used in medicine in this country, under the name of Castor Oil. When obtained by decoction of the bruised seeds in water, it is purer and less acrimonious than when obtained by expression. It is of a yellowish colour, and has scarcely any peculiar taste or smell.

As a laxative, castor oil acts mildly and effectually, and at the same time very quickly; it is the purgative particularly employed where any stimulant operation would be hurtful. Its dose is one ounce. It is taken floating on peppermint-water; mixed with any spiritous

liquor, or any purgative tincture, as that of senna; or diffused in water by the medium of gum, sugar, or the yolk of an egg.

FROM the Mineral Kingdom, two laxatives are derived, Sulphur and Magnesia.

SULPHUR is a simple inflammable substance, found in nature nearly pure, and likewise in combination with several of the metals. The sulphur of commerce is the produce of volcanic countries. It is naturally mixed with earthy matter, from which it is freed by sublimation, forming the Sulphur Sublimatum, Flores Sulphuris, or Flowers of Sulphur.

Pure sulphur is of a light yellow colour; is insipid; has a faint smell, when rubbed or heated; is very fusible and volatile; and when heated in atmospheric air, burns with a blue flame and suffocating fumes. It is insoluble in water or alkohol, but is dissolved by oils, and combines with the alkalies, several of the earths, metals, and metallic oxyds.

Sulphur, in a dose of two or three drachms, acts as a laxative, and so mildly, that it is often used in hæmorrhoidal affections. It likewise passes off by the skin, and is administered internally, and is applied externally in psora. It is best given in the form of electuary.

Offic. Prep.—Ol: Sulph. Ung: Sulph. *Ed.* Troch: Sulph. *Lond.*

MAGNESIA is a simple earth, not found pure in nature, but abundantly combined with certain acids; and from these saline combinations, it is obtained by processes, to be afterwards noticed. Either pure, or in the state of carbonat, it is used as an antacid and laxative, in a dose of a drachm or more. Its laxative operation is generally considered as owing to its meeting with an acid in the stomach, and forming a saline combination which has that power.

Offic. Prep.—Troch: Magn. *Lond.*

PURGATIVES.

CASSIA SENNA. Senna. *Decand. Monogyn. Lomentaceæ.*
Folia. Egypt, Arabia.

THE dried leaves of this plant are of a yellowish green colour; have a faint smell, and a bitter taste. Their active matter is extracted both by water and alcohol by infusion. By decoction with water, its activity is much impaired.

Senna is a purgative frequently employed. It is always given in the form of the watery infusion, two or three drachms being infused in four or six ounces of water, with the addition of a few coriander seeds, to cover its flavour, and obviate griping. It is also frequently combined with manna, with tamarinds or with acidulous tartarite of potash.

Offic. Prep.—Elect: Cass: Senn. Extr: Cass: Senn. Inf: Tam: Ind. cum Cas: Sen. T: Cass: Senn: C. *Ed.*
 —Inf: Senn: Simp. Inf: Senn: Tart. P: Senn: C. *Lond.*

RHEUM PALMATUM. Rhubarb. *Enneand. Trigyn.*
Oleraceæ. Radix. Tartary.

BESIDES the Rheum Palmatum, two other species, the Rheum Undulatum, and Rheum Compactum, are cultivated with the view of obtaining their roots, to be used in medicine; nor is any considerable difference, it is said, to be observed between them. The best rhubarb is imported from Turkey in small pieces, with a large hole in the middle. It is of a lively yellow colour, with streaks of white; has a smell peculiar, and somewhat aromatic; and a bitter slightly styptic taste. Another kind is imported from the East Indies, or rather from China, in larger masses, more compact and hard, heavier, less friable than the other, and having less of an aromatic flavour. Rhubarb, cultivated in this country, has been prepared equal to either of the others, but in general the British Rhubarb is much inferior.

Rhubarb contains a gummy and a resinous part, and likewise a portion of gallic acid. Proof-spirit dissolves all its active matter. The watery infusion is more purgative than the spiritous. The Chinese rhubarb seems to be more astringent than the Turkey. Every kind of it contains a quantity of earthy matter, chiefly lime, combined with sulphuric and citric acids. This is generally more abundant in the Turkey rhubarb than in the others.

The dose of rhubarb as a cathartic is one scruple or half a drachm. Along with its purgative operation, it exerts a moderately astringent power, and has hence been considered as peculiarly adapted to diarrhœa, any acrid matter being evacuated before it acts as an astringent. From the conjunction of bitterness with these qualities, it is likewise often used in dyspepsia and hypochondriasis, to obviate costiveness. Its astringent property is diminished in the watery infusion.

Offic. Prep.—Inf: Rhei P. Pil: Rhei C. T. Rhei P. T. Rhei cum Aloe. Vin: Rhei Palm. *Ed.*

CONVOLVULUS JALAPA. Jalap. *Pentand. Monogyn.*
Campanac. Radix. Mexico.

THE dried root of jalap is imported in thin transverse slices; solid, hard, and heavy; of a dark gray colour, and striated texture. It has little smell; its taste is bitter and subacrid.

Jalap contains a resinous and a gummy matter, its purgative quality residing in the former. Proof-spirit is its proper menstruum.

This root is an active purgative, producing a considerable degree of stimulus on the intestines. Its medium dose is half a drachm. Besides being given alone, it is very frequently used to quicken the action of other cathartics; of mild muriat of mercury for example; or is combined with others, which are supposed to render it less stimulating, as with the acidulous tartarite of potash.

Offic. Prep.—Extr: Conv: Jalap. P: Jalap: C. T. Conv: Jal. *Ed.*

HELLEBORUS NIGER. Melampodium. Black Hellebore.
Polyand. Polygyn. Multisiliq. Radix. Austria, Italy.

THE root of this plant consists of small fibres attached to one head, externally dark-coloured, internally white. Its taste is very acrid, but the acrimony is much impaired by drying and keeping.

Its medicinal power seems principally to depend on its resinous part. By decoction with water it yields half its weight of gummy matter, with some resin; the extract obtained by inspissation is milder than the root itself. Its distilled water, it is affirmed, is acrid, and even cathartic.

Black hellebore root is a very violent cathartic, in a dose from ten to twenty grains; so violent, indeed, that it is scarcely ever used. On its cathartic power probably depends any advantage that may be derived from its administration in mania and melancholia, in which diseases it was highly celebrated by the ancients. In dropsy it has been employed as a hydragogue cathartic. It was likewise strongly recommended by Mead as an emmenagogue, though with others it has seldom been successful.

Offic. Prep.—T: Helleb: N. *Ed.*

BRYONIA ALBA. Bryony. *Monœc. Syngenes. Cucurbitæ*
Radix. Indigenous.

THE root of this plant, when recent, is highly acrid; by drying it becomes milder. In a dose of twenty or thirty grains of the dried root, it acts as a strong cathartic, and generally also as a diuretic. It is however somewhat uncertain in its operation, and is little used.

CUCUMIS COLOCYNTHIS. Colocynth. *Monœc. Syngenes.*
Cucurbitæ. Fructûs pulpa. Syria.

THE part of this plant used in medicine, is the dried spongy or medullary part of the fruit. The taste of this is intensely bitter. Boiled in water it gives out a large portion of mucilage, less active than the colocynth itself. Alcohol also dissolves only part of its active matter.

Colocynth is one of the most drastic purgatives, and is even apt to occasion violent symptoms. Its dose is from three to six grains. It is seldom however given by itself, being rather used to promote the operation of other cathartics. Combinations of it with jalap, aloes, or mild muriat of mercury, are thus given in obstinate constipation, in mania, and coma. Its infusion has been recommended as an anthelmintic.

Offic. Prep.—Pil: Aloes cum Colocynth. *Ed.*

MOMORDICA ELATERIUM. Wild Cucumber. *Monœc.*
Syngenes. Cucurbit. Fecula; Fructus. South of Europe.

THE expressed juice of the fruit of this plant, on standing, deposits a fecula, which, when dried, has been known by the name of Elaterium. It is the most violent of all the cathartics, and has been exhibited only in the most obstinate cases. Its dose is half a grain, repeated every hour, or every second hour, till it operates.

RHAMNUS CATHARTICUS. Buckthorn. *Pentand. Monogyn. Dumosæ. Baccarum succus. Indigenous.*

THE expressed juice of Buckthorn berries has a cathartic power. Made into a syrup by boiling with sugar, it has been given in a dose of an ounce. It is disagreeable however in its operation, and is seldom used.

Offic. Prep.—Syr: Rhamn: C. *Ed.*

ALOE PERFOLIATA. Aloe Socotorina. Aloe Barbadensis. Socotorine, Barbadoes, or Hepatic Aloes. *Hexand. Monogyn. Liliaceæ. Succus spissatus. Africa, Asia, America.*

THE various kinds of aloes differ in their purity, and likewise in their sensible qualities.

The Socotorine is considered as the purest. It is in small pieces of a reddish-brown colour. The Barbadoes Aloes is in large masses, of a lighter colour, and having an odour much stronger and more unpleasant than the

former. The Hepatic is of a similar kind. The Cabbalinc is still more impure, and is weaker in its power. They are all the expressed juice of the above-mentioned species, reduced to a solid consistence by evaporation. Their taste is intensely bitter; their odour disagreeable. They consist of gum and resin, the former being in larger quantity. The smell and taste reside principally in the gum, as do the principal virtues of the aloes.

Aloes is a warm stimulating purgative, used principally to obviate costiveness. Its medium dose is from five to fifteen grains, nor does a larger quantity operate more effectually. Its operation is exerted upon the large intestines, principally on the rectum, and hence its purgative effect is slow and moderate. The stimulant action of aloes, it has been supposed, may be extended to the uterus, whence it is also used as an emmenagogue, and its exhibition is deemed improper during pregnancy: It has also been supposed, that its use is apt to induce or aggravate hæmorrhoidal affections.

Offic. Prep.—Pil: Aloes. Pil: Al: cum Assafœt. Pil: Aloes cum Colocynth. P: Aloes cum Myrrh. T: Aloes S. T: Aloes Æth. T: Aloes cum Myrrh. Vin: Aloes Socc. *Ed.*—Pil: Aloes Comp. Pulv: Al: cum Canella. Pulv: Al: cum Guaiac. Pulv: Aloes cum Ferro. T: Aloes C. *Lond.*

CONVOLVULUS SCAMMONIA. Scammony. *Pentand. Monogyn. Campanac. Gummi-resina. Syria.*

SCAMMONY is a gum-resin, obtained by cutting the root of the plant, and inspissating the juice which exudes, by exposure to the sun and air. It is in small fragments, of a blackish gray colour, having little smell, and a bitter subacid taste. It consists of resin and gum, in general nearly in equal proportions.

Scammony is one of the most drastic purgatives, employed chiefly in obstinate constipation. Its dose is from five to ten grains, but it is generally combined with other cathartics. It is also used as a hydragogue purgative in dropsy.

Offic. Prep.—Pulv: Scamm: C. *Ed.*—Pulv: Scamm: C: cum Aloe. P: Scamm: C: cum Calom. Elect: Scamm. *Lond.*

CAMBŒGIA GUTTA. Gambogia. Gamboge. *Polyand. Monogyn. Tricocca. Gummi-resina. East Indies.*

THIS gum-resin is obtained by exudation, from incisions made in the bark of the trunk of the tree. It is brittle, of a yellow colour, and has a taste bitter and acrid. Both water and alcohol partially dissolve it.

Gamboge is a very stimulating cathartic, apt in large doses to excite vomiting, or to act with violence. Its medium dose is from two to six grains. It is seldom employed but in combination with some of the other powerful cathartics, in obstinate constipation. It has also been used, however, to expel the tape-worm, and as a powerful hydragogue cathartic in dropsy.

SUB-MURIAS HYDRARGYRI. Sub-muriat, or Mild Muriat of Mercury.

THOUGH several of the preparations of mercury have a purgative operation, that of the mild muriat is most certain; and this preparation is even in common use as a cathartic. It is given in a dose of from five to ten grains, its operation being quickened by the addition of an equal quantity of jalap. In more obstinate cases, it is combined with colocynth, scammony, or gamboge; and such a combination affords the safest of the powerful cathartics.

A DIVISION of Cathartics remains, intermediate in their operation between the Laxatives and Purgatives, more powerful than the one, less violent and stimulating than the other. These are the Neutral Salts. They seem to act principally by stimulating the exhalant vessels on the inner surface of the intestines; and by the watery

evacuation they occasion, they are particularly adapted to those cases where inflammatory action or tendency to it exists.

SULPHAS MAGNESIÆ. Sulphat of Magnesia.

THIS salt, formerly known by the names of Bitter Purging Salt, and Epsom Salt, is found in mineral waters, whence it has been extracted, but at present is principally prepared by art, from the liquor remaining after the crystallization of muriat of soda from sea-water, which holds a quantity of muriat of magnesia dissolved. It is commonly in needle-like crystals, and deliquescent; but when pure, it forms large regular crystals, which are rather efflorescent. They are soluble in nearly an equal weight of water. Their taste is extremely bitter.

This salt is used as a purgative, in a dose of two ounces, dissolved in a large quantity of water. Though its taste be bitter, it has been remarked, that it remains better on the stomach than many other cathartics, especially when given in small repeated doses. Exhibited in this manner, it has been particularly recommended in ileus and colica pictonum.

SULPHAS SODÆ, Sulphat of Soda, long known by the name of Glauber's Salt, and afterwards by that of Vitriolated Soda.—It is generally obtained from the residuum of the decomposition of muriat of soda, by sulphuric acid, in the preparation of muriatic acid. The solid residuum is dissolved in water, any excess of acid is neutralized by the addition of a little lime, and the pure sulphat of soda is obtained by evaporation. Its crystals are six-sided prisms; they are efflorescent, soluble in three parts of cold, and in an equal part of boiling water. Its taste is very bitter and nauseous.

This salt is one of the saline purgatives in most common use. Its medium dose is an ounce and a half, dissolved in eight or twelve ounces of water.

SULPHAS POTASSÆ. Sulphat of Potash, formerly termed Vitriolated Tartar, prepared by the direct combination of its principles. Its taste is bitter; it requires seventeen parts of cold water for its solution. In a dose of four or six drachms, it acts as a purgative; in one of two or three drachms, it is given as an aperient.

SUPER-TARTRIS POTASSÆ. Acidulous Tartarite of Potash, formerly Purified Tartar, Crystals or Cream of Tartar, (Tartarus Purificatus, Crystalli vel Cremor Tartari.)

THIS salt is gradually deposited from wine on keeping, and is purified by repeated solutions and crystallizations. It consists of potash, with an excess of tartarous acid. Its taste is sour. It is sparingly soluble in water. As a mild laxative, it is frequently employed. Its dose is four or six drachms, given usually in the form of electuary. As a hydragogue and diuretic it is likewise employed in dropsy.

TARTRIS POTASSÆ. Tartarite of Potash.

THIS salt, the neutral tartarite of potash, formerly termed Soluble Tartar, (Tartarus Solubilis), is prepared by saturating the excess of acid in the acidulous tartarite by the addition of potash. It is more soluble in water than the other, and has a bitter taste. It is a mild purgative. Dose six drachms, or an ounce.

TARTRIS SODÆ ET POTASSÆ. Tartarite of Soda and Potash.

THIS salt, formerly known by the name of Rochelle Salt, is a triple one, being prepared by saturating the excess of acid in the acidulous tartarite of potash by soda.

and consisting therefore of potash and soda, combined with tartarous acid. It crystallizes in rhomboidal prisms. Its taste is less unpleasant than that of most of the other saline purgatives, and its action is nearly the same. Its usual dose is an ounce.

PHOSPHAS SODÆ. Phosphat of Soda.

THIS salt is prepared by decomposing the phosphat of lime obtained by burning bones to whiteness, by sulphuric acid. To the solution of acidulous phosphat of lime which is obtained, a solution of carbonat of soda is added, till there be a slight excess of alkali, and by evaporation the phosphat of soda is crystallized. Its crystals are rhomboidal prisms. Its taste is the least nauseous of all the saline purgatives, and its operation is equally mild and effectual. One ounce of it is given, dissolved generally in a pound of tepid water, or of soup made without salt.

BESIDES the preceding Cathartics, there are some employed only in the form of enema.

MURIAS SODÆ. Muriat of Soda, Common Sea Salt.

FROM half an ounce to an ounce of this, dissolved in a pound of tepid water, with the addition of an ounce of expressed oil, forms the common domestic enema.

TEREBINTHINA VENETA. Venice Turpentine.

THE resinous juice of the Larch tree, (*Pinus Larix*, *Monœc. Monadelph.*), is sometimes prescribed under the form of enema, half an ounce of it being triturated with the yolk of an egg, and suspended in a sufficient quantity of water. Dr. Cullen observes, that this affords a very certain cathartic, which may be employed in obstinate constipation.

NICOTIANA. Tobacco, (see p. 82.)

THE smoke of tobacco, introduced into the intestines, has sometimes succeeded in producing evacuation in colic and ileus, after other purgatives have failed. An infusion of from one to two drachms of it in a pint of warm water is more convenient, but much caution is requisite in the use of either, as tobacco, from its narcotic power, is apt to induce extreme sickness and debility.

CLASS VII.—EMMENAGOGUES.

THE medicines arranged under this class are those capable of promoting the menstrual discharge.

As the suppression of this discharge is usually owing to debility of the uterine vessels, or want of action in them, the medicines capable of exciting it must be those which can stimulate these vessels.

General stimulants or tonics must have this effect to a certain extent, and there are several stimulants both diffusible and permanent, employed as Emmenagogues.

It is doubtful, whether there are further any medicines, which have their stimulant operation particularly determined to the uterine vessels. There are several, however, which, acting on neighbouring parts, have their action extended to the uterus, and hence exert an emmenagogue power greater than can be ascribed to any general stimulant operation they exert on the system. Several cathartics act in this manner.

Under one or other of these divisions, may be arranged the principal medicines employed as Emmenagogues.

EMMENAGOGUES.

From the Class of Antispasmodics.

CASTOREUM.
FERULA ASSAFOETIDA.
BUBON GALBANUM.

From the Class of Tonics.

FERRUM.
HYDRARGYRUS.
CINCHONA OFFICINALIS.

From the Class of Cathartics.

ALOE.
HELLEBORUS NIGER.

SINAPIS ALBA.
ROSMARINUS OFFICINALIS.
RUBIA TINCTORUM.
RUTA GRAVEOLENS.
JUNIPERUS SABINA.

CASTOREUM. Castor, formerly described under the class of Antispasmodics, (page 87), has been given in a dose of ten, fifteen or twenty grains in amenorrhœa; but it is a medicine of very trifling power.

ASSAFOETIDA, (p. 89), has been given as an emmenagogue in a dose from five to twenty grains. The other foetid gums, Galbanum, Sagapenum and Ammoniacum, have been used with the same intention, but probably with no great advantage.

FERRUM, Iron, noticed under Tonics, (p. 99.) is often advantageously used as a general and permanent stimulant in amenorrhœa. The Carbonat of Iron, (*Rubigo Ferri Præparata*), is given in a dose of ten or fifteen grains; the Sulphat of Iron in three or four grains. The Chalybeate Mineral Waters are employed with perhaps still more advantage.

HYDRARGYRUS, (p. 94.)—Of the mercurial preparations, the Mild Muriat is employed in amenorrhœa as a general stimulant, in the dose of a grain night and morning; or it is combined with the fœtid gums, or with some of the drastic purgatives.

CINCHONA (p. 105.) Bark, especially under the form of the extract, is frequently conjoined with some of the preparations of iron, to furnish an emmenagogue.

ALOES, belonging to the class of Cathartics, (p. 157.) has been supposed to have a peculiar emmenagogue power, from the stimulus which it exerts on the large intestines being extended to the uterus. Some of the preparations of it, such as the *Tinctura Aloes cum Rheo*, or the *Pilulæ Aloes cum Myrrha*, are exhibited, or it is conjoined in substance with other remedies belonging to this class.

HELLEBORUS NIGER. Black Hellebore, (p. 156.)

THIS drastic purgative has, in modern practice, been employed chiefly as an emmenagogue. It is given under the form of tincture, one drachm being given at bedtime, and continued for some time. Its efficacy, however, is extremely uncertain. The extract is more powerful.

SINAPIS ALBA. Mustard. (p. 141.) *Semen*.

THE seeds of this plant are pungent and stimulating. They are generally taken unbruised, half an ounce being

a dose. This is not unfrequently used in amenorrhœa and chlorosis.

ROSMARINUS OFFICINALIS. Rosemary. *Diand. Monog. Verticillatæ. Summitates florentes.*

THE flowers and flowering tops of this plant have an aromatic flavour, with a degree of pungency, and afford by distillation a stimulating essential oil. It has been given under the form of infusion in amenorrhœa, but it is now banished from the prescriptions of the physician.

Offic. Prep.—Sp: Rosm: Off. *Ed.*

RUBIA TINCTORUM. Madder. *Tetrand. Monogyn. Stellatæ. Radix. South of Europe.*

THE root of this plant is of a red colour, has a bitter taste, with little smell. It has been recommended as an emmenagogue, in a dose from one scruple to half a drachm thrice a-day. But its inefficacy is at present generally acknowledged.

RUTA GRAVEOLENS. Ruta. Rue. *Decand. Monogyn. Multisiliq. Herba. South of Europe.*

THIS herb, when recent, has a strong unpleasant smell, and a bitter taste. By distillation it affords a pungent essential oil. The herb has been prescribed as an emmenagogue in the form of the watery infusion; and the oil is still sometimes combined with aloes, and other medicines of the same class.

Offic. Prep.—Extr: Rutæ Gr. *Ed.*

JUNIPERUS SABINA. Savin. *Dioecia. Monadelph. Conifera. Folia. South of Europe.*

THE leaves of this plant have a bitter penetrating taste, and a strong unpleasant odour. They afford a very large quantity of essential oil, possessing all the virtues of the plant.

Savin is a strong stimulant, the operation of which has been supposed to be powerfully directed to the uterine system. It has therefore been considered as an emmenagogue, but it is scarcely ever administered internally. Externally, the powder of the dried leaves is used as an escharotic.

Offic. Prep.—Extr: Sabinæ. T: Sab:C. *Lond.*

CLASS VIII.—DIURETICS.

DIURETICS are those medicines which increase the urinary discharge.

It is obvious that such an effect will be produced by any substance capable of stimulating the secreting vessels of the kidneys. All the saline diuretics seem to act in this manner. They are received into the circulation, and, passing off with the urine, stimulate the vessels, and increase the quantity secreted.

There are other diuretics, the effect of which appears not to arise from direct application, but from an action excited in the stomach, and propagated by nervous communication to the secreting urinary vessels. The Diuretic operation of squill, and of several other vegetables, appears to be of this kind.

There is still, perhaps, another mode in which certain substances produce a diuretic effect, that is, by promoting absorption. When a large quantity of watery fluid is introduced into the circulating mass, it stimulates the secreting vessels of the kidneys, and is carried off by the urine. If, therefore, absorption be promoted, and if a portion of serous fluid, perhaps previously effused, be taken up, the quantity of fluid secreted by the kidneys will be increased. In this way digitalis seems to act: Its diuretic effect, it has been said, is greater when exhibited in dropsy than it is in health.

On the same principle, (the effect arising from stimulating the absorbent system), may probably be explained

the utility of mercury in promoting the action of several diuretics.

The action of these remedies is promoted by drinking freely of mild diluents. It is also influenced by the state of the surface of the body. If external heat be applied, diuresis is frequently prevented, and diaphoresis produced. Hence the doses of them should be given in the course of the day, and the patient if possible be kept out of bed.

The direct effects of diuretics are sufficiently evident. They discharge the watery part of the blood; and by that discharge they indirectly promote absorption over the whole system.

Dropsy is the disease in which they are principally employed, and when they can be brought to act, the disease is removed, with less injury to the patient than it can be by exciting any other evacuation. Their success is very precarious, the most powerful often failing; and as the disease is so frequently connected with organic affection, even the removal of the effused fluid, when it takes place, only palliates without effecting a cure.

Diuretics have been likewise occasionally used in calculous affections, in gonorrhœa, and with the view of diminishing plethora, or checking profuse perspiration.

DIURETICS.

Saline Diuretics.

SUPER-TARTRIS POTASSÆ.

NITRAS POTASSÆ.

MURIAS AMMONIÆ.

ACETIS POTASSÆ.

POTASSA.

. *From the Vegetable Kingdom.*

SCILLA MARITIMA.

DIGITALIS PURPUREA.

NICOTIANA TABACUM.
 SOLANUM DULCAMARA.
 LACTUCA VIROSA.
 COLCHICUM AUTUMNALE.
 GRATIOLA OFFICINALIS.
 SPARTIUM SCOPARIUM.
 JUNIPERUS COMMUNIS.
 COPAIFERA OFFICINALIS.
 PINUS BALSAMEA.
 PINUS LARIX.

From the Animal Kingdom.

MELOE VESICATORIUS.

SALINE DIURETICS.

SUPER-TARTRIS POTASSÆ. (see p. 161.)

ACIDULOUS tartarite of potash, which has been already described as a cathartic, is likewise to be regarded as a diuretic, and as one of those most efficacious in the treatment of dropsy. It is given under two modes of exhibition, in which its effects are somewhat different. When given dissolved in a large quantity of water, to the extent of four or six drachms in the day, it acts simply as a diuretic; when given to the same extent, gradually increased, in the form of an electuary, (without the free use of diluents), along with a more or less diuretic effect, it acts as a hydragogue cathartic. The latter is the more usual, and perhaps, more successful mode of exhibition.

NITRAS POTASSÆ. Nitrat of Potash. Nitrum. Nitre.

THIS salt, consisting of nitric acid and potash, is found ready formed on the surface of the soil, in warm climates. In the South of Europe, its production is accelerated by artificial arrangements. Animal and vegetable substances, in a state of decomposition, are mixed with a quantity of carbonat of lime, and exposed to the air, but protected from the rain. After a certain

period, the materials are found to contain nitrat of lime and nitrat of potash. These salts are extracted by lixiviation with water: potash is added, by which the nitrat of lime is decomposed, and the quantity of nitrat of potash increased; and this salt is purified by repeated solutions and crystallizations.

During the process by which the nitrat of potash is formed, it appears that the azot of the animal matter combines partly with the oxygen of the atmospheric air, and partly with the oxygen of the animal substances. The resulting compound, the nitric acid, is attracted in part by the lime present, and in part by a quantity of potash, which seems to be likewise formed during the process.

Nitrat of potash is crystallized in hexahedral prisms. Its crystals are soluble in six parts of cold, and in an equal weight of boiling water. It is decomposed by heat, affording a large quantity of oxygen gas; and is hence an important pharmaceutic agent in oxydating bodies.

This salt has a cool and sharp taste, occasioning a sense of coldness in the stomach when swallowed. When given in moderate doses, its presence can be detected in the urine by chemical tests. Its virtues are those of a refrigerant and diuretic; and, as possessing both, it has been used principally to relieve ardor urinæ in gonorrhœa. The practice, however, is now exploded, from the belief that as it passes off by the urine, it must render it more stimulating. Its dose is from five to twenty grains repeated twice or thrice a-day, with the free use of diluents or demulcents.

Offic. Prep.—Troch: Nitrat: Pot. *Ed.*—Nitr. Purif. *Lond.*

MURIAS AMMONIÆ. Muriat of Ammonia. Sal Ammoniacus Crud. Crude Sal Ammoniac.

THIS salt is prepared by obtaining ammonia from animal substances by distillation, combining it with sulphuric acid, mixing this sulphat of ammonia with muriat

of soda, and exposing the mixture to heat. A double decomposition takes place, and the muriat of ammonia is sublimed. From its mode of preparation it is in solid masses, semitransparent, and somewhat ductile. It is soluble in about three parts of water at the temperature of 60°.

This salt may be made to act either as a diaphoretic or diuretic, according to the mode in which it is exhibited; but as an internal medicine it is scarcely ever prescribed. Externally it has been used as a discutient.

ACETIS POTASSÆ. Acetite of Potash. Lixiva Acetata.
Sal Diureticus. Tartar Regeneratum.

THIS salt, prepared by saturating potash with acetous acid, and evaporating the solution to dryness, has been considered as a powerful diuretic, and has been used in dropsy, half a drachm of it dissolved in water being given every hour or two till it operate. It is uncertain in its operation however, and has therefore fallen into disuse.

POTASSA. Potash, either pure, or in the state of the imperfect carbonat, is a diuretic; and by the older physicians the ashes of broom, wormwood, and several other vegetables, were frequently exhibited in dropsy. These, however, are merely carbonats of potash, more or less pure. The pure sub-carbonat, therefore, is preferred to them, though as a diuretic, it is little employed. Its dose is twenty or thirty grains dissolved in a large quantity of water, and repeated three or four times in the course of the day.

DIURETICS FROM THE VEGETABLE KINGDOM.

SCILLA MARITIMA. Squill. (See p. 140.)

THE root of this plant, it has already been remarked, is an emetic; in a smaller dose it proves diuretic, and in dropsy is employed as one of the most powerful medicines of that class. It is given in a dose of from one to three or four grains of the dried root, the dose being gradually increased till it excites diuresis, or affects the stomach; nausea ought however, if possible, to be prevented. Its diuretic power is much promoted by combination with mercury: either the corrosive, or the mild muriat of the metal, may be employed; the latter is preferred, two or three grains of it being given in the evening, and the doses of the squill in the course of the day: or the mercury may be applied by friction in the form of ointment.

DIGITALIS PURPUREA. Foxglove. (See p. 81.)

DIGITALIS, though one of the most powerful narcotics, acts likewise as one of the most certain diuretics in dropsy, apparently from its power of promoting absorption. It has frequently succeeded where the other diuretics have failed. It is given in substance, in the watery infusion, or in tincture. In substance the dose is at first one grain of the dried leaves twice a-day; and this form is perhaps preferable to any other. It excites absorption perhaps more effectually, and has less tendency to excite nausea, as it must act more gradually on the stomach.

The administration of this remedy requires to be conducted with much caution. Its effects do not immediately appear; and when the doses are too frequent or too quickly augmented, its action is concentrated so as to produce frequently the most violent symptoms. The general rules, according to which it may be given, are, to begin with a small dose, with one grain, for example, of the powdered leaves twice in the twenty-four hours; to increase it half

a grain every second day, continuing this increase till the action of the remedy is apparent on the kidneys, stomach, intestines, or vascular system; and immediately suspending its exhibition when its effects on any of these parts take place. When diuresis is induced, it generally continues for some time; and if the water should not be entirely evacuated when it ceases, the administration of the digitalis may be cautiously renewed.

The symptoms arising from too large a dose of digitalis, are, extreme sickness, vertigo, indistinct vision, incessant vomiting, and a great reduction of the force of the circulation, terminating sometimes in syncope or convulsions. They are relieved by frequent and small doses of opium, by brandy, aromatics, and strong bitters, and by a blister applied to the region of the stomach.

Foxglove has been supposed, from its diuretic power, to be likewise useful in epilepsy and insania, depending on serous effusion in the brain, and in asthma, owing to effusion in the bronchiæ; but its efficacy in these is probably partly owing to its narcotic power.

NICOTIANA TABACUM. Tobacco. (See p. 82.)

TOBACCO has been recommended as a diuretic in dropsy, one ounce of the dried leaves being infused in a pint of water, and six or ten drops being given, and gradually increased to 60 or even 100. It possesses, however, no peculiar advantage to recommend it, and its diuretic effect is generally accompanied with sickness and vertigo.

SOLANUM DULCAMARA. Woody Nightshade. Bitter-Sweet. *Pentand. Monogyn. Solanac. Stipites. Indigenous.*

THE young shoots or branches are the part of this plant used in medicine; when first chewed, they have a bitter taste, which is soon followed by a degree of sweetness; their smell is strong and disagreeable. By drying, their activity is much impaired.

An infusion of the dried stalks in water has been recommended as a diuretic in dropsy, but it is a remedy of uncertain operation, and is scarcely ever prescribed.

LACTUCA VIROSA. Sweet-scented Lettuce. (See p. 82.)

THIS plant, though it possesses a narcotic quality, is also a diuretic, and has been recommended under the form of the inspissated juice as a remedy in dropsy, the dose being gradually increased from five or ten grains to two or three drachms. It is never used.

COLCHICUM AUTUMNALE. Meadow Saffron. *Colchicum.*
Hexand. Trigyn. Liliaceæ. Radix. Indigenous.

THE root of this plant, when recent, is extremely acrid; a very small quantity occasioning a sense of burning heat in the stomach, strangury and tenesmus; at other times, however, it is found entirely void of acrimony; differences probably owing to climate, age or season. It was recommended by Störck as a remedy in dropsy, under the form of oxymel or syrup; but from the uncertainty of its operation, it has not been established in practice.

Offic. Prep.—Syr: Colch: A. *Ed.* Oxymel: Colch. *Lond.* Acet: Colch. *Dub.*

GRATIOLA OFFICINALIS. Hedge-Hyssop. *Diand. Monogyn. Personatæ. Herba. South of Europe.*

THE leaves of this plant have a strong bitter taste, with little smell. They prove emetic and cathartic, but in a smaller dose exert a diuretic operation, and have been recommended under the form of infusion in the treatment of dropsy. As a remedy, however, gratiola is uncertain, and sometimes violent in its operation.

SPARTIUM SCOPARIUM. Broom. *Diadelph. Decand. Papilionaceæ. Summitates. Indigenous.*

THE tops of the young branches of the broom have a bitter taste, which is communicated both to water and

alkohol. The watery decoction has been used with success as a remedy in dropsy. It acts in general both as a cathartic and diuretic.

JUNIPERUS COMMUNIS. Juniper. *Diœcia. Monadelph. Coniferæ. Baccæ. Indigenus.*

THE berries of this shrub have an aromatic smell, and a warm sweetish taste, with a degree of bitterness, which depends on the inclosed seeds. Distilled with water they afford a considerable quantity of essential oil.

Juniper berries given in infusion prove diuretic. The spirit of juniper, or diluted alkohol impregnated with the essential oil, has also been prescribed as a cordial and diuretic in dropsy.

Offic. Prep.—Spir: Junip: C: Comp. *Ed.*

COPAIFERA OFFICINALIS. Balsamum Copaibæ. Balsam of Capaiba or Copaiva. *Decand. Monogyn. Dumosæ. Balsamum. South America.**

THIS balsam is the produce by exudation from incisions made in the trunk of the tree. It is thick and tenacious, with a yellow tinge; has a peculiar smell not disagreeable, and a pungent bitter taste. It is soluble in alkohol, and in expressed and essential oils. Distilled with water, it affords nearly half its weight of an essential oil, an insipid resin being the residuum.

Balsam of copaiba increases the urinary discharge, and communicates to the urine a violet odour. In too large a dose it excites inflammation of the urinary passages. From its power of stimulating these parts, it frequently proves successful in the cure of gleet.

It has also been given in leucorrhœa, and in hæmorrhoidal affections. Its dose is twenty or thirty drops twice or thrice a-day, given in the form of bolus, or, what is preferable, diffused in water by the medium of mucilage.

PINUS BALSAMEA. Balsamum Canadense. Canadian Balsam. *Monœcia. Monadelph. Coniferæ. Balsamum. North America.*

THIS balsam exudes spontaneously from the trunk of the tree. It is of a light yellow colour, tenacious, and inflammable. By keeping it becomes thicker; its smell is agreeable; its taste pungent. It is soluble in alcohol and oils, and affords an essential oil by distillation.

The medicinal virtues of this balsam seem to be the same as those of copaiba, and it is used for the same purposes. Its dose is from thirty to fifty drops.

PINUS LARIX. Terebinthina Veneta. Venice Turpentine. *Monœcia. Monadelph. Coniferæ.*

THIS balsam exudes spontaneously, and in greater abundance from incisions in the tree. It is thick and tenacious, pellucid, of a yellowish colour, has a peculiar smell, and a bitter pungent taste. By distillation, with the addition of a small quantity of water, to prevent the temperature from rising too high, it affords a large quantity of an essential oil, (*Oleum Terebinthinæ*, Oil of Turpentine,) the residuum being a resin nearly insipid, (*Resina Alba vel Flava*), Common, White, or Yellow Resin.

Venice turpentine derives all its virtues from its essential oil, and it is this oil that is generally used in medicine. It is a powerful stimulant, directed more particularly in its action to the urinary passages. It has been employed in gleet, and in chronic rheumatism, especially in that form of it termed *Ischias*, in a dose of from five to twelve drops, gradually increased, generally mixed with a quantity of honey, by which its pungency is covered. It is apt, however, to induce violent symptoms. Externally, it is applied as a stimulant to parts affected with cramp and rheumatism. The turpentine itself is sometimes used internally for the same purposes as its oil. The white resin is somewhat stimulant and diuretic;

but it is only employed in the composition of ointments and plasters, which it renders more adhesive, and perhaps more stimulating.

PISTACIA TEREBINTHINUS. Chio or Cyprus Turpentine. *Diæc. Pentand.*

THIS turpentine is rather more fragrant and grateful than the preceding; but its virtues are the same. The same observation may be made with respect to the Strasburgh Turpentine, the produce of the *Pinus Picea*.

The common Turpentine, (*Terebinthus Communis*), the produce of the *Pinus Sylvestris*, contains less essential oil, and is more offensive to the stomach than any of the other turpentine.

DIURETICS FROM THE ANIMAL KINGDOM.

MELOE VESICATORIUS. Cantharis. Spanish Fly. Cantharides. *Coleoptera*.

THE Cantharis is an insect, collected from the leaves of plants in Spain and Italy, and dried in the sun. It is of a lively green colour; has a faint unpleasant smell, and a taste slightly acrid. The active matter of this insect inflames and excoriates the skin, and is used as the basis of the common vesicatories. Internally administered it acts with much violence on the urinary passages. In dropsy, it has been given as a diuretic in a dose of one grain once or twice a-day, continued for some time: it has been prescribed in a similar dose in obstinate gleet and leucorrhœa, and in retention of urine arising from debility of the body of the bladder, or in the opposite affection of incontinence of urine from debility of the sphincter. It is principally in these two latter affections, that the internal administration of cantharides is attempted.

Offic. Prep.—Emp: Mel: Ves. Emp: Mel. Ves: Comp. T: Mel: Ves. Ung: Pulv: Mel: V. Ung: Inf: Mel: V. *Ed.*

CLASS IX.—DIAPHORETICS.

DIAPHORETICS are those medicines which increase the natural exhalation by the skin. When this is carried so far as to be condensed on the surface, it forms Sweat; and the medicines producing it are named Sudorifics. Between Diaphoretics and Sudorifics, there is no distinction; the operation is in both cases the same, and differs only in degree, from augmentation of dose, or employment of assistant means.

Since diaphoresis or sweat is merely the increase of the natural exhalation, it must arise from increased action of the cutaneous exhalant vessels, and the medicines belonging to this class must be those which are capable of exciting that action.

Of stimulants capable of producing this effect, the application of heat to the surface affords an example. It is one of the most effectual, and is always employed to promote the action of sudorifics.

The same effect may be produced indirectly, by increasing the general force of the circulation, which acts as a stimulus on the exhalant vessels, and increases their discharge.

By one or other of these modes of operation, the medicines classed as Diaphoretics seem to act.

The Saline Diaphoretics, as they do not sensibly augment the force of the circulation, probably act in the former manner, exerting a particular action on the stomach, which is communicated to the vessels of the skin, or perhaps being received into the blood, and directly applied to these vessels.

Those diaphoretics, on the contrary, which are termed Heating, as the aromatic oils and resins, act by directly stimulating the heart and arteries, and increasing the force of the circulation.

Diaphoresis is not, however, the necessary consequence of the circulation being increased; for the surface often remains dry, where the pulse is frequent and strong. In

this case, a morbid constriction of the cutaneous vessels exists, which opposes a resistence to the impetus of the blood. Whatever, therefore, relaxes these vessels, will favour the production of sweating; and to this mode of operation probably is to be ascribed the diaphoresis produced by antimonial preparations, or by ipecacuan, and in part the advantage derived from the use of warm diluents in promoting sweat. When these circumstances, the increase of the force of the circulation, and the relaxation of the cutaneous vessels, are conjoined, the sweating will be still more copious; and from this probably arises the superiority of the combination of opium with antimony or ipecacuan, to any other sudorific.

The primary effects of diaphoretics, are to evacuate the watery part of the blood, and thus lessen the quantity of fluid in the circulating system; to determine the blood to the surface; to increase the action of the absorbents, and to remove spasmodic constriction of the cutaneous vessels, and render the skin moist.

The first of these effects probably takes place to no great degree, as the free use of diluents makes part of the sweating regimen.

The last effect, the changing the state of the vessels on the skin, is the most important, considered in a practical point of view, that diaphoretics produce, as on this their efficacy in fever, in which principally they are employed, depends.

The limits to the practice of sweating in affections of a febrile kind, are now sufficiently established. It is attended with advantage in synocha, and the various phlegmasiæ; but in fevers of the typhoid kind it is useless, and, unless in the very commencement of the disease, is uniformly hurtful.

As evacuating the serous part of the blood, and as promoting absorption, sudorifics have been used with advantage in the different species of dropsy, especially in anasarca.

By determining to the surface, and preserving a gentle diaphoresis, they are found serviceable in asthma, dyspepsia, habitual diarrhœa, chronic dysentery, and chronic

rheumatism, and likewise in a number of cutaneous diseases, probably by altering the state of the extreme vessels of the skin.

A few circumstances are to be attended to in the administration of sudorifics. In inflammatory affections, if the action of the vascular system is strong, bleeding should be previously used: during the sweating, the free use of warm diluents is necessary; and external cold ought to be guarded against.

The particular diaphoretics may be arranged from the affinity in their operation, as they act by increasing the force of the circulation, or as they operate without producing any general stimulant effect.

DIAPHORETICS.

AMMONIA.

MURIAS AMMONIÆ.

ACETIS AMMONIÆ.

CITRAS AMMONIÆ.

SUB-MURIAS HYDRARGYRI.

ANTIMONIUM.

OPIUM.

CAMPHOR.

GUIACUM OFFICINALE.

DAPHNE MEZEREUM.

SMILAX SARSAPARILLA.

LAURUS SASSAFRAS.

COCHLEARIA ARMORACIA.

SALVIA OFFICINALIS.

OF the Saline Substances, all those that have been mentioned as diuretics, may, by the assistance of the sweating regimen, be brought to act as Diaphoretics. Those that have AMMONIA for their base, are supposed to be so more powerfully. Murias Ammoniæ, Muriat of Ammo-

nia, (page 170.), has been used for this purpose in a dose of one drachm, dissolved in six ounces of tepid water. Acetite of Ammonia, prepared by saturating the common distilled vinegar, by adding to it carbonat of ammonia, is in common use as a diaphoretic, one ounce of the fluid being given every hour till it operate. Very analagous in operation, and as frequently used, is the Citrat of Ammonia, prepared by saturating ammonia with lemon juice. Pure Ammonia or its Carbonat is still more powerful. From forty to eighty drops of the Aqua Ammoniæ, or from five to fifteen grains of the carbonat, may be given, the sudorific operation being promoted by warm diluents.

HYDRARGYRUS, (see p. 94.)—Of the preparations of mercury, the Mild Muriat, alone, or in combination with opium, has been supposed to increase the insensible perspiration, and to this it has been supposed is owing its efficiency in certain cutaneous diseases, and in chronic rheumatism.

ANTIMONIUM, (see p. 142).—The preparations of antimony may all be exhibited so as to prove sudorific. Those that are in present use are, the Oxidum Antimonii cum Phosphate Calcis, and the Tartris Potassæ et Antimonii. Both are employed in febrile affections; the former in a dose from three to eight grains, repeated every third or fourth hour; the latter in a dose of one-half or one-fourth of a grain, repeated in the same manner, the action of both being promoted by diluents.

IPECACUANHA, (see p. 139).—As the antimonial preparations prove diaphoretic in part by their nauseating power, other emetics may be supposed to have a similar effect. Ipecacuan has accordingly been given as a diaphoretic, in a dose of two or three grains, repeated at intervals of one or two hours.

OPIUM. (See p. 74).—Opium is justly regarded as a diaphoretic of considerable power. As it acts in a great measure by its stimulant operation, it is considered as

dangerous in highly inflammatory diseases, even when determined to the surface by the sweating regimen. Its administration in such cases is rendered more safe, while its sudorific power is rendered more certain, by combination with ipecacuan, or antimony. The compound powder of ipecacuan, consisting of one part of ipecacuan, one part of opium, and eight of sulphat of potash, is a very powerful sudorific, given in a dose from fifteen to twenty-five grains. The combination of opium with antimony is generally made by adding thirty or forty drops of antimonial wine to twenty-five or thirty drops of tincture of opium, and forming them into a draught.

CAMPHOR. (See p. 72).—This stimulant has been employed as a diaphoretic. Its power in this respect is increased by combination with opium, mild muriat of mercury, or some of the antimonial preparations.

GUIACUM OFFICINALE. Guaiac. *Decand. Monogyn. Gruinales. Lignum et Gummi-resina. South America and West Indies.*

THE wood of this tree, and the gum-resin obtained by exudation from incisions in its trunk, are the parts of it used in medicine.

The wood is hard and heavy, is of a yellowish colour, has little smell, and a moderately warm bitter taste. Its virtues depend on the small portion of resinous matter which it contains.

Guaiac was introduced into practice as a remedy in the treatment of lues venerea, and was at one time considered capable of effecting a radical cure. Its powers are now better ascertained. It is employed, and with some advantage, in promoting the action of mercury in the confirmed state of the disease, and in alleviating the various symptoms which arise from a protracted mercurial course. It is likewise frequently prescribed in cutaneous diseases, in scrofulous affections, and in chronic rheumatism.

The form in which guaiac wood is administered, is always that of decoction. A quart of it is drunk in the course of the day. If taken warm it produces diaphoresis.

Offic. Prep.—Dec: Guaiac: Off: Comp. *Ed.*

L

GUIACUM. Gummi-Resina.

THIS gum-resin exudes from incisions made in the trunk of the guaiac tree. It is friable, of a greenish or grayish colour, has an odour somewhat fragrant, and a warm bitterish taste. It contains about three-fourths of its weight of resin, in which its virtues reside. Proof-spirit is its proper solvent.

Guaiac is a stimulating medicine, proving diaphoretic in a dose of about half a drachm, and purgative in a larger dose. It is a common remedy in chronic rheumatism, given so as to excite sweat, or in smaller doses to keep up a gentle diaphoresis. Its sudorific power is promoted by opium or tartarized antimony. It is given either in substance in the form of bolus, or diffused in water by the medium of mucilage, or in tincture. The tincture of it in spirit of ammonia is more stimulant than that in proof-spirit, and is generally preferred.

Offic. Prep.—T: Guajac. T: Guajac: Amm. *Ed.*

DAPHNE MEZEREUM. Mezercon. *Pentand. Monogyn.* *Vepriculæ. Cortex radicis. Indigenous.*

THE bark of the root of this plant is the part of it used in medicine: its taste when it is chewed for some time is extremely acrid; its acrimony is somewhat impaired by drying; it is extracted by water and vinegar.

Mezereon is a stimulating diaphoretic, which, by determining to the surface, has been found of service in chronic rheumatism, and in cutaneous diseases. Its principal use has been in syphilis; as being, in particular, efficacious in removing venereal nodes, and thickening of the ligaments and periosteum, and disposing ulcerations to heal. It is given in the form of decoction, two drachms

of the bark, with half an ounce of liquorice root, being boiled in three pounds of water, to two pounds, and four or six ounces of this being given four times a-day. It is generally combined with guaiac and sarsaparilla. Such a combination forms the *Decoctum Sarsaparillæ Compositum*, an improved formula for the Lisbon diet drink.

Offic. Prep.—Dec: Daphn: Mez. *Ed.*

SMILAX SARSAPARILLA. Sarsaparilla. *Diæcia. Hexand. Sarmentac. Radix. South America.*

THIS root is in long tender twigs, internally white, and covered with a brownish bark: it has scarcely any smell; its taste is mucilaginous, and slightly bitter. Water extracts its bitterness; by beating it with water, a portion of fecula is separated, white and insipid, in which chiefly the virtues of the root appear to reside.

Sarsaparilla, though it has been ranked by writers on the *Materia Medica* as a diaphoretic, can scarcely be said to have any virtue of this kind. It is rather placed in this class, as being associated with the medicines with which it is usually prescribed. It has been considered as a specific in the treatment of some venereal affections, particularly those of the bones or periosteum, and as a restorative in that state of debility which is the consequence of the disease, or of the mercurial action. Though its virtues have been considered as much exaggerated, it is still regarded by many practitioners as efficacious in such cases. It has also been recommended in extensive ulceration, in cutaneous affections, and in chronic rheumatism. It is given in the form of decoction, and is very frequently joined with guaiac and mezereon.

Offic. Prep.—Dec: Smil: Sarsap. *Ed.*—Dec: Sarsap: Comp. *Lond.*

LAURUS SASSAFRAS. Sassafras. *Enneand. Monogyn. Oleraceæ. Lignum. America.*

THIS wood has a moderately fragrant smell, and a sweetish aromatic taste. It affords an essential oil by dis-

tillation, and yields to water, by infusion, its flavour, and part of its taste.

Sassafras is slightly stimulant and diaphoretic. Its infusion has been drunk freely in cutaneous diseases, and in chronic rheumatism. It has also been frequently added to decoctions of sarsaparilla, guaiac and mezereon, but probably without communicating any real virtue.

COCHLEARIA ARMORACIA. Raphanus rusticanus.
Horse-radish. *Tetradyn. Silic. Siliquosæ. Radix.*
Indigenus.

THE root of this plant when recent, has a penetrating taste, with a degree of sweetness. Its pungency resides in an essential oil, and is therefore lost by drying. Water and alcohol may be impregnated with it.

Horse-radish is a stimulant capable of promoting perspiration, and of acting as a diuretic and expectorant. It has been recommended in paralysis and rheumatism, in asthma and dropsy, about a drachm of the recent root cut in small pieces being swallowed whole. It is little used. Externally it has been applied as a rubefacient, and its syrup has been used as a remedy for hoarseness.

Offic. Prep.—Sp: Raphan: Comp. *Lond.*

SALVIA OFFICINALIS. Sage. *Diand. Monogyn. Verticillatæ. Folia. South of Europe.*

THE leaves of this shrub have an aromatic smell, and a warm bitterish taste. Its aqueous infusion drunk warm, has been used to produce sweat, or to promote the action of sudorifics; the aromatic quality of the sage may perhaps add something to the power of the warm diluent.

CLASS X —EXPECTORANTS.

EXPECTORANTS have been defined, those medicines which facilitate or promote the rejection of mucus or other fluids from the lungs and trachea. The theory of their operation is very imperfectly understood. It has been supposed that where a greater quantity of fluid is thrown out into the lungs than the exhalants can take up, there are remedies which may facilitate its rejection. But as expectoration is an operation partly voluntary, and dependent on the action of a number of muscles, it is difficult to discover how such an effect can be produced. If by expectorants be meant substances capable of producing it by some specific action on the parts concerned, there seems no reason to believe in the existence of such remedies.

Dr. Cullen supposed that expectorants might act by promoting the exhalation of a thin fluid, which diluting the viscid mucus present in the mucous follicles in the lungs and trachea, might facilitate its rejection. But the action of the different individuals belonging to the class, and especially their effects in various diseases, cannot be explained on this principle.

There are probably various modes of operation by which certain remedies will appear to promote expectoration, and which will give them a claim to the title of Expectorants.

Thus, in certain diseases the exhalant vessels in the lungs, seem to be in that state, by which the exhalation of fluid is lessened, or nearly stopped, and in such cases expectoration must be diminished. Any medicine capable of removing that constricted state, will appear to promote expectoration, and will at least relieve some of the symptoms of the disease. It is apparently by such a mode of operation, that antimony, ipecacuan, squill, and some others, promote expectoration in pneumonia, catarrh, and asthma, the principal diseases in which expectorants are employed.

There is a case of an opposite kind, that in which there is a redundance of mucus in the lungs, as occurs in humoral asthma, and *catarrhus senilis*. In these affections, certain expectorants are supposed to prove useful. If they do so, it is probably by being determined more particularly in their action to the pulmonary vessels, and by their moderate stimulus diminishing the secretion, or increasing the absorption, thus lessening the quantity of fluid, and thereby rendering the expectoration of the remainder more easy. The determination of these substances to the lungs is often perceptible by their odour in the air expired. A similar diminution of fluid in the lungs may be effected by determining to the surface of the body, and those expectorants which belong to the class of diaphoretics probably act in this manner.

Expectorants, then, are to be regarded, not as medicines which directly assist the rejection of a fluid already secreted, but rather as either increasing the natural exhalation where it is deficient, or diminishing the quantity of fluid where it is too copious, either by stimulating the pulmonary vessels, or by determining to the surface. In both cases expectoration will appear to be promoted or facilitated.

Pneumonia, catarrh and asthma, are the principal diseases in which expectorants are employed; and the mode in which they prove useful will be apparent from what has been said of their operation.

EXPECTORANTS.

ANTIMONIUM.

IPECACUANHA.

NICOTIANA TABACUM.

DIGITALIS PURPUREA.

SCILLA MARITIMA.

ALLIUM SATIVUM.

POLYGALA SENEGA.

AMMONIACUM.

MYRRHA.

STYRAX BENZOIN.

STYRAX OFFICINALE.

TOLUIFERA BALSAMUM.

MYROXOLON PERUIFERUM.

AMYRIS GILEADENSIS.

ANTIMONIUM. (See p. 142.)—The greater number of the preparations of antimony may be used as expectorants, but the one commonly employed is the Tartarized Antimony. In pneumonia, catarrh, pertussis, and some forms of asthma, it is given in a dose of one-eighth of a grain repeated every second or third hour. It is also frequently added to other expectorants.

IPECACUANHA.—Ipecacuan is similar to antimony in its operation, and has been given in the same diseases in a dose of two or three grains.

DIGITALIS.—Foxglove, in dose of half a grain, has been employed as an expectorant in asthma.

NICOTIANA.—Tobacco, in the form of its watery extract, has been highly recommended as an expectorant in chronic catarrh and humoral asthma. Its dose one, two or three grains.

SCILLA. (See p. 140.)—Squill is one of the most powerful of the medicines classed as expectorants. It is considered as too stimulating to be administered where the inflammatory diathesis is prevalent; but when that is diminished, it is given with safety and advantage in pneumonia, in catarrh, pertussis and asthma. Its dose is one grain of the dried root, half a drachm of the squill vinegar, or one drachm of the syrup. Its efficacy is increased by combining it with tartrate of antimony, or mild muriat of mercury.

ALLIUM SATIVUM. Garlic. *Hexand. Monogyn. Liliaceæ. Radix. South of Europe.*

THE root of this plant, which is of the bulbous kind, has, when recent, a strong fœtid smell and acrid taste. By being long kept it becomes shrivelled and inert. Its taste and smell are extracted by water by infusion; by decoction they are nearly lost. By distillation it affords an essential oil odorous and acrid.

Garlic is a stimulant, capable of acting as a diuretic, diaphoretic and expectorant; hence its use in dropsy, rheumatism, and humoral asthma. Its dose is half a drachm or two scruples. It is swallowed whole, or made into pills with soap. A syrup prepared by digesting it in vinegar, and boiling the fluid with the due proportion of sugar, has been frequently used as an expectorant. Externally it is applied as a stimulant and rubefacient.

Offic. Prep.—Syr: Allii. *Dub.*

POLYGALA SENEGA. Seneka. Rattlesnake-root. *Dia-delph. Octand. Lomentac. Radix. North America.*

THE taste of this root is bitter and pungent. Its active matter is extracted partially by water, completely by alcohol.

Seneka has been frequently employed as an expectorant in pneumonia, after the highly inflammatory stage has been subdued. Its dose is from ten to twenty grains, but it is generally used in the form of decoction, of which, when prepared according to the formula of the Edinburgh College, one ounce, or one ounce and a half may be given every second or third hour.

Offic. Prep.—Dec: Polygal: Seneg. *Ed.*

AMMONIACUM. Ammoniac. *Gummi-resina.*

THIS gum-resin is brought from Egypt and the East Indies; the tree which produces it is unknown. It is in large masses, or, when of the best quality, in small round

fragments, yellow on the surface, and white within. It has a faint smell, and a nauseous taste. It contains nearly half its weight of resin, which is dissolved by alcohol. Water triturated with it forms a milky-like mixture.

Gum-ammoniac is principally employed as an expectorant, and is frequently prescribed in asthma and chronic catarrh. Its dose is from ten to thirty grains; it is given under the form of pill, or diffused in water, and is frequently combined with squill or tartrate of antimony. Externally it is applied as a discutient, under the form of plaster, to white swelling of the knee, and to indolent tumors.

The process ordered in the London Pharmacopœia for its purification, rather injures than improves it.

Offic. Prep.—Ammon: Purif. Emp: Amm: cum Hydr. Lac Ammon. *Lond.*

ASSAFOETIDA. (See p. 89.) — This gum-resin is not inferior to ammoniac as an expectorant in asthma and pertussis. It is given in a dose from ten to twenty grains.

MYRRHA. Myrrh. *Gummi-resina.*

MYRRH is the produce of Arabia and Abyssinia; the plant from which it is obtained is unknown. It is in small irregular pieces of a brown colour, has a fragrant smell, and a warm bitter taste. It consists of gum and resin; its virtues residing chiefly in the latter. Alcohol dissolves the resin. Water boiled on the myrrh dissolves the gum, to which part of the resin adheres, and this evaporated affords the watery extract.

Myrrh is an expectorant, which has been regarded as too stimulating to be employed in pneumonic affections, or in phthisis, but which has been often employed in asthma and chronic catarrh. Its dose is from ten to twenty grains. The watery extract which has been preferred by many physicians to the myrrh itself, seems to be an injudicious preparation, as the myrrh is merely weakened in power. The tincture of myrrh is in common use exter-

nally as a stimulating application to foul ulcers, and to spongy gums.

Offic. Prep.—Tinet: Myrrh. *Ed.*—P: Myrrh: C. *Lond.*

STYRAX BENZOIN. Benzoinum. Benzoin or Benjamin. *Decand. Monogyn. Bicornes. Balsamum. East Indes.*

THIS balsam, obtained by exudation, is in brittle masses, composed of brown and white fragments; its smell is fragrant; it has little taste. It consists almost wholly of resin, and is therefore nearly entirely soluble in alcohol. It likewise contains a portion of a peculiar acid, which, as it exists in greater quantity in it than in any other vegetable matter, is named Acid of Benzoin. It is obtained from it by sublimation; is in white brilliant scales, retains the flavour of the benzoin, and with acidity has likewise a degree of pungency.

Benzoin is rarely employed in medicine. Its acid is used as an expectorant in asthma, in a dose of ten or fifteen grains; but it is probably a medicine of little power. It enters into the composition of the ammoniated and camphorated tinctures of opium.

Offic. Prep.—T: Benz: C. *Ed.*

STYRAX OFFICINALE. Storax. *Decand. Monogyn. Bicornes. Balsamum. S. of Europe, Asia.*

THIS substance is in masses soft and slightly unctuous, of a brown colour, has a strong fragrant odour, and bitterish pungent taste. It consists principally of resin, with a small portion of acid of benzoin.

Storax resembles benzoin in its virtues. It was formerly used as an expectorant, but is now little regarded.

TOLUIFERA BALSAMUM. Balsamum Tolutanum. Balsam of Tolu. *Decand. Monogyn. Lomentac. South America.*

TOLU balsam is obtained from incisions in the trunk of the tree; it thickens, and in time becomes concrete; it has a fragrant odour, and a warm sweetish taste. It dissolves entirely in alcohol, and communicates its odour

and taste to water by boiling. It contains acid of benzoïn. This is the mildest of all the balsams. It has been used as an expectorant, but its powers are very inconsiderable, and it is at present employed principally on account of its flavour.

Offic. Prep.—Syr: Toluif: Bals. T: Toluif: B. *Ed.*

MYROXOLON PERUIFERUM. Balsamum Peruvianum. Peruvian Balsam. *Decand. Monogyn. Lomentaceæ. South America.*

THIS balsam is said to be extracted by boiling the bark and young branches of the tree with water, but it is more probable, as affirmed by others, that it is obtained by exudation. It is thick and viscid, of a reddish-brown colour, has a strong fragrant smell, and a bitter pungent taste. It affords a small portion of essential oil by distillation, and of acid of benzoïn by sublimation. Its remaining matter is resinous. It is entirely soluble in alcohol.

Peruvian balsam is considerably stimulant. It has been employed as an expectorant in asthma, and as a remedy in paralysis, chronic rheumatism, and leucorrhœa. Its dose is from five to fifteen grains.

Offic. Prep.—T: Bals: Per. *Lond.*

AMYRIS GILEADENSIS. Balsamum Gileadense. Balsam or Balm of Gilead. *Octand. Monogyn. Dumosæ. Arabia.*

THIS balsam, obtained by incisions made in the trunk of the tree, is highly fragrant, and is so much valued in the east, that it is said not to be imported into Europe. A coarser kind is met with, obtained by strong decoction of the branches and leaves, and adulterated by various mixtures. This is of a yellow colour, and thick consistence; its taste is warm and bitter; its flavour somewhat fragrant. It is soluble in alcohol.

The medicinal virtues of the genuine balsam of Gilead have been very highly rated, undoubtedly with much ex-

aggregation. The common balsam is scarcely used; but its qualities seem to be very similar to those of the balsam of Tolu, with perhaps more acrimony.

CLASS XI.—SIALAGOGUES.

SIALAGOGUES are substances which increase the quantity of the salivary discharge. This may be effected by the mastication of certain acrid substances, or by the internal exhibition of certain medicines.

Of those which act in the latter mode, *Mercury* is the only one that uniformly produces this effect. No satisfactory explanation has been given of this peculiar power which it exerts; and the inquiry why it should be particularly directed to the salivary glands, appears as fruitless as that into the specific virtue of any medicine. It does not from its sialagogue power appear to be of advantage in the treatment of any disease; salivation being only a test of its action on the system, but not in itself of any utility.

The remaining sialagogues are those which act merely by topical application by mastication, and from their acrid stimulating quality. By increasing the salivary discharge, they have been found of service in toothach, and, as has been supposed, in some kinds of headach.

SIALAGOGUES.

HYDRARGYRUS.

ANTHEMIS PYRETHRUM.

ARUM MACULATUM.

AMOMUM ZINGIBER.

DAPHNE MEZEREUM.

NICOTIANA TABACUM.

HYDRARGYRUS. (p. 94.) Mercury. —All the preparations of this metal, when given in sufficient quantity, excite salivation, accompanied with a sense of heat, and swelling in the gums. It is an effect from which, as has just been observed, no advantage appears to be derived.

ANTHEMIS PYRETHRUM. Pellitory of Spain. *Syngenes. Polygam. superfl. Compositæ. Radix. South of Europe.*

THIS root, though cultivated in this country, is generally imported from Spain. Its taste is hot and acrid, its acrimony residing in a resinous principle. It is a remedy which, from stimulating the salivary glands, and exciting a discharge of saliva, is used in toothach, and sometimes gives relief. It has also been chewed in palsy of the muscles of the throat.

ARUM MACULATUM. Wake-Robin. *Gynand. Polyand. Piperitæ. Radix. Indigenous.*

THE root of this plant, when recent, is extremely acrid; by drying, its acrimony is much impaired. It resembles pellitory, and may be applied to the same purposes, but its pungency is unpleasant. Internally, it has been used as a stimulant.

Offic. Prep.—Conserv: Ari. *Lond.*

GINGER and MEZEREUM have in like manner from their acrimony been sometimes used as sialagogues. The use of TOBACCO for the same purpose is sufficiently well known.

CLASS XII.—ERRHINES.

ERRHINES are medicines which occasion a discharge from the nostrils, either of a mucous or serous fluid. They all operate by direct application, and generally in

consequence of a greater or less degree of acrimony which they possess. Their practical uses, it is evident, must be very limited. By the evacuation they occasion, it is supposed that they may diminish the quantity of fluid in the neighbouring vessels; and that they hence may prove useful in rheumatic affections of these parts, in headach, pain of the ear, and ophthalmia. They are sometimes used with advantage in some of these affections. It has likewise been imagined that they may be of use in preventing apoplexy.

ERRHINES.

IRIS FLORENTINA.

ÆSCULUS HIPPOCASTANUM.

ORIGANUM MAJORANA.

LAVANDULA SPICA.

ASARUM EUROPÆUM.

VERATRUM ALBUM.

NICOTIANA TABACUM.

EUPHORBIA OFFICINALIS.

SUB-SULPHAS HYDRARGYRI.

IRIS FLORENTINA. Florentine Orris. *Triand. Monogyn.*
Ensatae. Radix. South of Europe.

THE root of this plant, freed from its outer bark, is white and wrinkled, has a pleasant odour, and slightly bitter taste. It is a mild sternutatory, and enters into the composition of some cephalic snuffs, principally on account of its fragrance.

ÆSCULUS HIPPOCASTANUM. Horse-Chesnut. *Hep-
tand. Monogyn. Trihilatæ. Semen. Cortex.*

THE fruit of this tree is principally farinaceous. It acts as a moderate sternatutory. The bark is bitter, and has been proposed as a substitute for Peruvian Bark.

ORIGANUM MAJORANA. Sweet Marjoram. *Didynam. Gymnosperm. Verticillatæ. Herba. South of Europe.*

The leaves of this herb have an aromatic odour, and, when dried and powdered, a slight errhine power.

LAVANDULA SPICA. Lavender. *Didynam. Gymnosperm. Verticillat. Spicæ florentes. S. of Eur.*

LAVENDER flowers have a fragrant smell, and a warm bitterish taste. They yield a quantity of essential oil, which is employed in medicine as a stimulant, when combined with alcohol, and other aromatics. The dried leaves in powder are slightly errhine.

Off. Prep. Spir: Lavand: Sp. T: Lav: C. *Ed.*

NICOTIANA. Tobacco. (See p. 82.)

THE powdered leaves of Tobacco are in common use as an errhine; the powder of its dried leaves being the basis of the different kinds of snuff.

ASARUM EUROPÆUM. Asarabacca. *Dodecand. Monogyn. Sarmentac. Folia. Indigenous.*

THE leaves of this plant possess a greater degree of errhine power than any of those hitherto noticed, and are employed as the basis of the officinal sternutatory powders.

Offic. Prep.—P: Asar: Europ: C. *Ed.*

VERATRUM ALBUM. Helleborus Albus. White Hellebore. *Polygam. Monœc. Liliaceæ. Radix. South of Europe.*

THE root of this plant has a strong disagreeable smell when fresh, which is lost by drying, and an acrid taste which is retained. Snuffed up the nostrils in very small quantity, it excites violent sneezing, with a sense of heat, and a copious discharge. Taken internally, in the dose of a few grains, it acts as a violent emetic and cathartic. Externally, when mixed with lard, or in the form of decoction, it is used as an application in some cutaneous diseases.

Offic. Prep.—T: Verat: A. *Ed.*—Dec: Helleb: Alb. *Lond.*—Ung: Helleb: A. *Dub.*

EUPHORBIA OFFICINALIS. *Dodecand. Trigynia. Gummi-resina. Africa.*

THIS substance, which is of a resinous nature, is in small round fragments, having scarcely any smell, but a very acrimonious taste. It is never given internally. Its powder is the most violent of all the errhines, occasioning a copious discharge, with a sense of heat, and even inflammation. Hence it is perhaps never employed. Externally it has been used as a rubefacient or vesicatory.

SUB-SULPHAS HYDRARGYRI. Sub-sulphat of Mercury.
(See p. 97.)

THIS preparation of mercury has been recommended as an errhine in chronic ophthalmia; one grain of it being mixed with six or eight grains of any mild vegetable powder, and snuffed up the nostrils occasionally.

CLASS XIII.—EPISPASTICS AND RUBEFACIENTS.

THESE, as they operate on the same principles, and produce the same effects only in different degrees, may be considered merely as subdivisions of one class.

EPISPASTICS AND RUBEFACIENTS.

MELOE VESICATORIUS.

AMMONIA.

PIX BURGUNDICA.

SINAPIS ALBA.

ALLIUM SATIVUM.

EPISPASTICS.

EPISPASTICS are those substances which are capable, when applied to the surface of the body, of producing a serous or puriform discharge, by exciting a previous state of inflammation. The term, though comprehending likewise issues and setons, is more commonly restricted to blisters,—those applications which, exciting inflammation on the skin, occasion a thin serous fluid to be poured from the exhalants, raise the cuticle, and form the appearance of a vesicle. This effect arises from their strong stimulating power, and to this stimulant operation, and the pain they excite, are to be ascribed the advantages derived from them in the treatment of disease. The evacuation they occasion is too inconsiderable to have any effect.

It is a principle sufficiently established with regard to the living system, that where a morbid action exists, it may often be removed by inducing an action of a differ-

ent kind in the same or in a neighbouring part. On this principle is explained the utility of blisters in local inflammation and spasmodic action, and it regulates their application in pneumonia, gastritis, hepatitis, phrenitis, angina, rheumatism, colic, and spasmodic affections of the stomach; diseases in which they are employed with the most marked advantage.

A similar principle exists with respect to pain; exciting one pain often relieves another. Hence blisters often give relief in toothach, and some other painful affections.

Lastly, blisters, by their operation, communicate a stimulus to the whole system, and raise the vigour of the circulation. Hence, in part, their utility in fevers of the typhoid kind, though in such cases they are used with still more advantage to obviate or remove local inflammation.

MELOE VESICATORIUS. Cantharis. (See p. 177.)

THIS is the substance employed for blistering. The powdered cantharides is mixed with lard and wax, so as to form a plaster of a proper consistence, which is applied to the part for ten or twelve hours. The vesicle is then cut, and the inflamed part dressed with any mild ointment.

After a blister has been raised, it is often of advantage to convert the serous into a purulent discharge, by exciting suppuration, or to form what is termed an Issue. This is done by applying to the blistered part any acrid stimulating ointment; one, for example, containing a small proportion of powdered cantharides; or any foreign body, retained on the inflamed part, answers the same purpose by the irritation it keeps up. When by any of these means a puriform discharge is established in a part, considerable effects arise from the morbid action which it excites, and the evacuation it occasions. It is a practice often employed with advantage in asthma, paralysis, and a variety of chronic affections.

RUBEFACIENTS.

RUBEFACIENTS excite pain and inflammation, but in a less degree than blisters, so that no fluid is discharged. They stimulate the system in general, and obviate local inflammation, and are used for nearly the same purposes as blisters.

Any stimulating application may be used for this purpose.

CANTHARIDES added in a small proportion to a plaster, or the Tincture of Cantharides applied by friction to a part, is often employed as a rubefacient.

AMMONIA mixed with one, two, or three parts of expressed oil, forms a liniment frequently used for this purpose in rheumatism, angina, and other cases of local inflammation.

Offic. Prep.—Ol: Ammon. *Ed.*

PINUS ABIES. Pix Burgundica. Burgundy Pitch. *Monæcia. Monadelph. Coniferæ. Resina.*

THIS substance is obtained by exudation, from incisions in the trunk of the tree. It is boiled with a small quantity of water; is strained; and when cold, forms a concrete resinous matter. This, spread upon leather, and applied to the skin, excites a slight degree of inflammation, and exudation of serous fluid. It is used with advantage in catarrh, pertussis and dyspnœa.

Offic. Prep.—Emp: Pic: Burg. *Dub.*

SINAPIS. Mustard. (See page 141).—The flour of mustard-seed, mixed with an equal part of wheat-flour or crumbs of bread, and made into a paste with vinegar, forms what is termed a Sinapism, which acts as a powerful rubefacient. It is applied to the soles of the feet in typhoid fevers, where there is extreme debility, or determination to the head. It is also used in the same manner in comatose affections.

Offic. Prep.—Catap: Sinapeos. *Lond.*

ALLIUM. Garlick. (See p. 189).—The bruised root of this plant, applied to the soles of the feet, produces effects similar to those of the sinapism, and is used for the same purpose.

REMEDIES ACTING CHEMICALLY.

CLASS XIV.—REFRIGERANTS.

THE remedies comprized under this class have been usually defined, Substances which directly diminish the force of the circulation, and reduce the heat of the body, without occasioning any diminution of sensibility or nervous energy. The theories that have been delivered respecting their mode of operation, are obscure or unintelligible; and even the facts which are adduced to establish the existence of such remedies, are far from being conclusive.

Keeping in view the very inconsiderable action of these remedies, it may perhaps be possible, from the consideration of the mode in which animal temperature is generated, to point out how their trivial refrigerant effects may be produced.

It has been sufficiently established, that the consumption of oxygen in the lungs is materially influenced by the nature of the ingesta received into the stomach; that it is increased by animal food and spiritous liquors, and in general by whatever substances contain a comparatively small quantity of oxygen in their composition. But the superior temperature of animals is derived from the consumption of oxygen gas by respiration. An increase of that consumption must necessarily, therefore, occasion a greater evolution of caloric in the system, and of course an increase of temperature, while a diminution in the consumption of oxygen must have an opposite effect. If, therefore, when the temperature of the body is morbidly increased, substances be introduced into the

stomach, containing a large proportion of oxygen, especially in a state of loose combination, and capable of being assimilated by the digestive powers, the nutritious matter received into the blood must contain a larger proportion of oxygen than usual; less of that principle will be consumed in the lungs, by which means less caloric being evolved, the temperature of the body must be reduced; and this operating as a reduction of stimulus, will diminish the number and force of the contractions of the heart.

It might be supposed that any effect of this kind must be trivial, and it actually is so. It is, as Cullen has remarked, not very evident to our senses, nor easily subjected to experiment, and is found only in consequence of frequent repetitions.

The principal refrigerants are the Acids, especially those belonging to the vegetable kingdom. As these contain a large proportion of concrete oxygen in a state of loose combination, their refrigerant power may be explained on the above principle. The Neutral Salts form the remaining division of refrigerants; they are much inferior in power; and what refrigerant quality they do exert, probably arises from the same cause. In some of them, it may be increased by the sensation of cold they excite in the stomach, which is equivalent to an abstraction of stimulus.

It is obvious, that the indication to be fulfilled by the use of refrigerants, is the reduction of the morbidly increased temperature. Hence they are administered in synocha and other inflammatory affections, and likewise in fevers of the typhoid kind.

REFRIGERANTS.

CITRUS AURANTIUM.

CITRUS MEDICA.

TAMARINDUS INDICA.

ACIDUM ACETOSUM.

SUPER-TARTRIS POTASSÆ.

NITRAS POTASSÆ.

BORAS SODÆ.

ACIDS.

ALL acids are supposed to be Refrigerants; but the vegetable acids are allowed to possess this power in a more eminent degree.

The native vegetable acids are found chiefly in the fruits of vegetables. The sour juice of these fruits consists either of the Citric or Malic Acids, or more frequently of a mixture of both. The citric acid is that which is most largely employed, as it forms chiefly the acid juice of the orange and lemon, the two acid fruits in common medicinal use.

CITRUS AURANTIUM. (Page 114). The Orange.
Succus fructûs.

THE juice of this fruit is sour, accompanied in the variety termed the China Orange with a degree of sweetness, in the Seville Orange with a slight bitterness. The former is used as a refrigerant in febrile affections, and as a remedy in scurvy.

CITRUS MEDICA. Lemonum. Lemon. (Page 114).
Succus fructûs.

THE juice of this fruit consists of nearly pure citric acid, mixed with saccharine and mucilaginous matter.

It is perhaps the most powerful of the class of refrigerants; it may be considered as a remedy nearly infallible in scurvy, and of late it has been used with apparent advantage in syphilis, though its anti-venereal power seems to be inferior to that of the nitric acid.

This acid is likewise in use as a refrigerant, when combined with potash or ammonia, forming the common saline mixture. It is probable, however, that by this combination its refrigerant quality is diminished. When the mixture of lemon-juice with carbonat of potash is swallowed, during the effervescence excited by their mutual action, it is found frequently effectual in checking vomiting, and is often used for that purpose; a virtue probably owing in a great measure to the action of the carbonic acid on the stomach.

TAMARINDUS INDICA. Tamarind. (See p. 152.)

THE pulp of this fruit contains a large quantity of acid, found to be principally the Tartarous; partly pure, and partly combined with potash, forming acidulous tartrate, mixed also with citric acid. A solution of it in water is a common cooling beverage in febrile affections.

ACIDUM ACETOSUM. Acetum. Acetous Acid. Vinegar.

THIS acid is the product of fermentation from solutions of saccharine matter, or sweet vegetable juices, and appears to be formed by the oxygenation of the alcohol formed in the first stage of the fermentative process. In common vinegar, the acid is mixed with saccharine and mucilaginous matter, and with a portion of tartarous acid; it is freed from these by distillation, though it remains still diluted with a large portion of water. It is obtained in a purer and more concentrated state, by decomposing any of the alkaline or earthy acetites by sulphuric acid. When the metallic acetites are decomposed by heat, the acid is slightly changed in composition, and acetic acid formed.

As a refrigerant, vinegar has been occasionally employed in febrile affections. It is also given as an antidote to the vegetable poisons. Externally, it is used as an application to burns, and as a discutient. In pharmacy, it is employed as the solvent of the active matter of several vegetable substances.

Offic. Prep.—Acid: Acet: Dis. Acid: Acet: Arom. Acid: Acet: Camph. Syr: Acid: Acet. *Ed.*

SUPER-TARTRIS POTASSÆ.

FROM the excess of acid which this salt contains, it possesses the virtues of a refrigerant. A solution of it in a large quantity of water, sweetened with sugar, forms a cooling beverage, used in febrile affections, and recommended, especially in hospital practice, by its cheapness.

NITRAS POTASSÆ. Nitrat of Potash. Nitre. (See p. 169.)

THIS salt is not unfrequently used as a refrigerant in acute inflammatory diseases. It is given in a dose of from five to fifteen grains repeated every four or five hours. When given in larger doses, it occasions severe nausea, and pain of the stomach. It is often also used in the form of gargle in the different species of cynanche, one drachm being dissolved in six or eight ounces of water.

BORAS SODÆ. Borat of Soda. Borax.

THIS salt, consisting of boracic acid, united with soda, the soda being slightly in excess, is brought from Thibet, where it is found in a native state. It is purified in Europe by crystallization; its taste is cool; it is soluble in eighteen parts of cold, and six of hot water. It is decomposed by several of the acids.

Borax is never used internally in modern practice, nor does it appear to possess any activity. Its solution is in common use as a cooling gargle; and mixed with an equal part of sugar, it is used in the form of powder, to remove the aphthous crust from the tongue in children.

CLASS XV.—ANTACIDS.

ANTACIDS are remedies which obviate acidity in the stomach. Their action is purely chemical, as they merely combine with the acid present, and neutralize it. They are only palliatives, the generation of acidity being to be prevented by restoring the tone of the stomach, and its vessels. Dyspepsia and Diarrhœa are the diseases in which they are employed.

 ANTACIDS.

POTASSA.

SODA.

AMMONIA.

CALX.

CARBONAS CALCIS.

MAGNESIA.

ALKALIES.—These are sometimes used to correct acidity. The solution of Pure Potash (*Aqua Potassæ*), is used for this purpose in a dose of fifteen drops; or from five to fifteen grains of carbonat of potash or soda, dissolved in water, are given. The solution of soda or potash, super-saturated with carbonic acid, is more frequently used, as being more pleasant.

Ammonia has been recommended as preferable to every other antacid, from twenty to forty drops of the *Aqua Ammonix* being given in a cupful of water.

Aqua Calcis, Lime-water, is likewise used to correct acidity, six or eight ounces being taken occasionally.

CARBONAS CALCIS. (P. 133.)—Of this there are two varieties medicinally employed, *Creta Alba*, and *Lapilli Cancrorum*: the former named by the Edinburgh College, *Carbonas Calcis Mollior*, and the latter, *Carbonas Calcis Durior*.

CRETA ALBA. White Chalk.—This is a carbonat of lime, found abundantly in nature; it always contains more or less argillaceous and siliceous earths. From the grosser impurities with which it is mixed, it is freed by levigation and washing. It is then termed Prepared Chalk, (*Creta Præparata.*)

Chalk is an antacid in very common use. As the salt it forms with the acid in the stomach has no purgative quality, it is the one commonly employed to check diarrhœa proceeding from acidity. It is given in a dose of one or two drachms, with the addition of a small quantity of any aromatic. The chalk potion of the Edinburgh Pharmacopœia affords the best form for administering it.

CARBONAS CALCIS DURIOR. *Cancerorum Lapilli et Chelæ. Cancer Astacus. Cancer Pagurus.*

IN the head and stomach of the river craw-fish are found certain concretions, consisting of carbonat of lime, with animal matter. These are prepared by levigation, and washing with water. They are termed *Lapilli Cancerorum præparati*, formerly *Oculi Cancerorum præparati*. The tips of the claws of the common sea-crab, are precisely similar in composition, and are prepared in the same manner. They are named *Chelæ Cancerorum præparatæ*.

Both these substances are carbonats of lime, free from the other earths which chalk always contains, and therefore preferable to it for medicinal use.

MAGNESIA. *Carbonas Magnesizæ.* (See p. 153.)

MAGNESIA, either pure, or in the state of carbona, is used as an antacid: the former in the dose of twenty or thirty grains; the latter in double that quantity. The salt it affords, with the acid in the stomach, proves slightly purgative; and this is the only reason for distinction in practice between this earth and the carbonat of lime.

CLASS XVI.—LITHONTRIPTICS.

LITHONTRIPTICS are medicines supposed to be capable of dissolving urinary calculi. Their operation is entirely chemical.

The researches of modern chemists have proved, that these calculi in general consist principally of a peculiar animal acid, named the Lithic or Uric Acid. With this substance the alkalies are capable of uniting, and of forming a soluble compound; and these are accordingly the sole Lithontriptics.

From the exhibition of alkaline remedies, the symptoms arising from a stone in the bladder are very generally alleviated; and they can be given to such an extent, that the urine becomes sensibly alkaline, and is even capable of exerting a solvent power on these concretions. Their administration cannot, however, be continued to this extent for any considerable length of time, from the strong irritation they produce on the stomach and urinary organs. The use, therefore, of the alkalies as solvents, or lithontriptics, is now scarcely ever attempted; they are employed merely to prevent the increase of the concretion, and to palliate the painful symptoms, which they do, apparently by preventing the generation of lithic acid, or the separation of it by the kidneys; the urine is thus rendered less irritating, and the surface of the calculus is allowed to become smooth.

When the alkalies are employed with this view, they are generally given saturated, or even super-saturated, with carbonic acid. This renders them much less irritating. It at the same time diminishes, indeed, their solvent power; for the alkaline carbonats exert no action on the urinary calculi: But they are still equally capable of correcting that acidity in the *primæ viæ*, which is the cause of the deposition of the lithic acid from the urine, and therefore serve equally to palliate the disease. And when their acrimony is thus lessened, their use can be continued for any length of time.

LITHONTRIPTICS.

POTASSA.

CARBONAS POTASSÆ.

SODA.

CARBONAS SODÆ.

SAPO ALBUS.

CALX.

POTASSA. Potash.

THIS alkali is obtained from the incineration of the woody parts of vegetables. The ashes are washed with water; the potash partly combined with carbonic acid, and smaller portions of neutral salts are separated from the carbonaceous matter; and the dry mass obtained by evaporation of this solution, is the Potash of commerce. The sub-carbonat of potash is obtained pure from this by solution and evaporation; and the pure potash by adding lime to the sub-carbonat, to abstract its carbonic acid.

The solution of potash, the Aqua Potassæ of the Edinburgh Pharmacopœia, may be given as a lithontriptic, or solvent of urinary calculus, in a dose of fifteen or twenty drops morning and evening, increasing it gradually as far as the stomach can bear. It is rendered less irritating when given in a large quantity of some gelatinous or mucilaginous liquor; but even with any management it cannot be long continued in a large dose, and therefore it is now seldom used.

The form under which this alkali is generally used, is the solution super-saturated with carbonic acid. Taken regularly to the extent of one or two pounds in the day, it relieves the painful symptoms which calculus produces.

Offic. Prep.—Aq: Super-Carb: Potass. Aq: Potass.
Ed.

SODA.—This alkali is obtained from the combustion of a number of sea-plants. The ashes semivitrified by the heat, form the Barilla of commerce, from which the carbonat of soda is extracted by solution in water and crystallization. Its crystals contain half their weight of water of crystallization, and are soluble in two parts of cold, and in an equal part of boiling water.

As a lithontriptic, or rather as a palliative in calculus, soda is given in the form of the watery solution, supersaturated with carbonic acid. Of this from one to two pounds are taken daily.

Another form in which the carbonat of soda is given, is that of pill. The crystals are exposed to a very gentle heat, till they lose their water of crystallization, and the dry powder obtained is made into pills with soap. Of these half a drachm or a drachm are taken in the course of the day.

Offic. Prep.—Aq: Super-Carb: Sodæ. *Ed.*

SAPO ALBUS.—Soap is a form under which the fixed alkalies have been administered in calculous affections. It is a chemical combination of expressed oil with potash or soda. In the purer soaps, soda is employed, with the mildest vegetable expressed oils. It is white, but sometimes designedly coloured, by the addition to the soap, while fluid, of a solution of sulphat of iron.

The acrimony of the alkali is much diminished by its combination with the oil, and on this account soap has been preferred as a lithontriptic, one or two ounces being taken in the course of the day. From the oil it contains, it is nauseous, and in such large doses generally offensive to the stomach.

CALX.—Lime in the form of lime-water, has been used in calculus, in the quantity of a quart or more daily; and it may prove useful by correcting acidity.

BITTERS and astringents have been found of service in calculous cases, evidently by restoring the tone of the stomach, and thus preventing the generation of acid. But they cannot be considered as Lithontriptics.

CLASS XVII.—ESCHAROTICS.

ESCHAROTICS are substances capable of dissolving animal matter; applied to the skin, they erode it, and to an ulcer, they remove its surface. They are employed to consume excrescences, to open an ulcer, and to change the diseased surface of a sore already existing. Their action is entirely chemical.

ESCHAROTICS.

ACIDA MINERALIA.

POTASSA.

NITRAS ARGENTI.

MURIAS ANTIMONII.

SULPHAS CUPRI.

ACETIS CUPRI.

MURIAS HYDRARGYRI.

SUB-NITRAS HYDRARGYRI.

OXIDUM ARSENICI ALBUM.

JUNIPERUS SABINA.

THE MINERAL ACIDS act rapidly as Escharotics, but from being fluid they can seldom be conveniently applied.

POTASSA. (See p. 209.)—Pure Potash, in its solid state, forms a powerful escharotic; mixed with a quantity of lime, it becomes rather milder. The one was formerly termed *Causticum Commune Acerrimum*; the other, *Causticum Commune Mitius*. Either of them is made into a paste with soap, and applied to the part.

NITRAS ARGENTI. *Causticum Lunare*.—Nitrat of Silver, fused and run into moulds, forms the caustic which is most frequently employed. It is merely moistened, and the part intended to be eroded, touched with it.

MURIAS ANTIMONII.—This is a caustic which has been used, but it is inconvenient from being in the fluid form, from which it cannot be confined to the part.

SULPHAS CUPRI.—This salt is a mild escharotic, and solutions of it are frequently used for the general purposes to which escharotics are applied.

ACETIS CUPRI. Acetite of Copper. *Ærugo Æris.* Verdigrise.

In its escharotic power, the acetite of copper is still milder, than the sulphat.

MURIAS HYDRARGYRI CORROSIVUS. Corrosive Muriat of Mercury.

THIS preparation of Mercury is frequently employed as an escharotic. Its solution in water, in the proportion of one grain to the ounce, is in particular applied to venereal ulcers.

SUB-NITRAS HYDRARGYRI. Sub-nitrat of Mercury.

THIS is employed with the same intention as the preceding. It is sprinkled on the part in powder, or is applied mixed with lard in the form of ointment.

OXIDUM ARSENICI ALBUM. (See p. 101.)

WHITE oxyd of arsenic has been frequently employed as an external application to cancer, and acts in part at least by its escharotic power. It was first introduced as an empirical remedy, and was applied, mixed with several vegetable powders, and made into a paste with the yolk of an egg. By surgeons it is generally used in the form of solution, ten grains being dissolved in one ounce of water, and this solution applied by a pencil to the sore. It not unfrequently amends the discharge,

causes the sore to contract in size, and cases have even been related of its having effected a cure. Violent pain is sometimes produced by its application; and in some cases, from its continuance, the general system appears to be affected. It requires, therefore, to be used with caution.

JUNIPERUS SABINA. Savine. (See p. 166.)

THE powdered leaves of savine possess an acrid power, whence they are employed as escharotic. The powder sprinkled on warts or excrescences removes them, or made into an ointment with lard, is used as an application to old ulcers, and to some obstinate cutaneous affections.



REMEDIES ACTING MECHANICALLY.

CLASS XVIII.—ANTHELMINTICS.

ANTHELMINTICS are those medicines used to expel worms from the intestinal canal. The greater number of them act mechanically, dislodging the worms, by the sharpness or roughness of their particles, or by their cathartic operation. Some seem to have no other qualities than those of powerful bitters, by which they either prove noxious to these animals, or remove that debility of the digestive organs, by which the food is not properly assimilated, or the secreted fluids poured into the intestines are not properly prepared; circumstances from which it has been supposed the generation of worms may arise.

ANTHELMINTICS.

DOLICHOS PRURIENS.
 FERRI LIMATURA.
 STANNUM PULVERATUM.
 OLEA EUROPÆA.
 ARTEMISIA SANTONICA.
 SPIGELIA MARILANDICA.
 POLYPODIUM FILIX MAS.
 TANACETUM VULGARE.
 GEOFFRÆA INERMIS.
 CAMBOGIA GUTTA.
 SUB-MURIAS HYDRARGYRI.

DOLICHOS PRURIENS. Cowhage. *Diadelph. Decand.*
Papilionaceæ. Pubes leguminis rigida. East and West
Indies.

THE down of the pods of this plant, consisting of very sharp spiculæ, is the part used as an anthelmintic. It is made into an electuary, with syrup or molasses, of which two tea-spoonfuls are given to an adult, and repeated two or three times, a cathartic being afterwards exhibited. Its action is entirely mechanical.

FERRUM. Iron.—The filings of this metal have been given as an anthelmintic, in a dose of one or two drachms. The rust of iron has likewise been recommended, particularly as a remedy against the tænia, when taken to the extent of three or four drachms.

STANNUM. Tin.—Tin is reduced to a powder, consisting of small rounded particles, by heating it nearly to its melting point, and agitating it briskly. This powder is used as an anthelmintic, in a dose of one or two

drachms, or even in a much larger quantity. It is taken repeatedly in the morning, and a cathartic is afterwards exhibited. Its effect is mechanical.

OLEA EUROPÆA. Olive Oil. *Oleum Olivarum. Diand. Monogyn. Sepiariæ. Oleum expressum. South of Europe.*

OLIVE Oil, or any other expressed oil, taken in the morning to the extent of half a pound, or as much as the stomach can bear, has been found serviceable as an anthelmintic.

ARTEMISIA SANTONICA. Wormseed. *Syngen. Polygam. superfl. Compositæ. Semen. Persia.*

THE seeds of this plant have a faint disagreeable smell, and a very bitter taste. They are employed as an anthelmintic; the dose half a drachm, or a drachm of the powder to an adult. This, after being continued for some time, is followed by a dose of a cathartic.

SPIGELIA MARILANDICA. *Caryophyllus Indicus. Indian Pink. Pentand. Monogyn. Stellatæ. Radix. North America.*

THE root and stalks of this plant are used in medicine; they have a bitter taste; in a large dose prove purgative, and in a still larger narcotic.

The spigelia is used as an anthelmintic, in the form of the watery infusion; in the quantity of half a drachm, or even to the extent of two or three drachms to an adult. A purgative is given after it.

POLYPODIUM FILIX MAS. Male Fern. *Cryptogamia. Filices. Radix. Indigenus.*

THE root of this plant has been employed as an anthelmintic, especially as a remedy against the tænia; two or three drachms of the powder of it being taken in the

morning, and a strong cathartic of jalap or gamboge given soon after it. It is now seldom used.

TANACETUM VULGARE. Tansy. *Syngen. Polyg. superfl. Compositæ. Folia & flores. Indigenus.*

THE leaves and flowers of this plant have a strong bitter taste, with some aromatic quality. They have been recommended as an anthelmintic, and especially as capable of expelling the lumbrici. The dose, in powder, is from one scruple to one drachm. They are little used.

GEOFFRÆA INERMIS. Cabbage-Bark tree. *Diadelph. Decand. Papilionac. Cortex. Jamaica.*

THE bark of this tree has an unpleasant smell, with a sweetish taste. It is used as a powerful anthelmintic, under the form of decoction. Its dose in substance is thirty grains, and it generally operates as a cathartic as well as anthelmintic. Some caution is requisite in its use, not to over-dose it; it is likewise necessary, to avoid drinking cold water during its operation, this inducing sickness and vomiting.

Offic. Prep.—Decoct: Geoffr: In. *Ed.*

CAMBOGIA. (See p. 159.)—Gamboge has been justly celebrated as a remedy against the tapeworm. It is given in a dose from five to twenty grains by itself, or combined with two parts of acidulous tartrate of potash.

SUB-MURIAS HYDRARGYRI.—Several of the preparations of mercury have been used for their anthelmintic power; this is entitled to the preference. It is given by itself, in a dose of ten or twelve grains to an adult, or in a smaller quantity, combined with jalap or rhubarb. It is also generally the basis of the cathartic usually administered after other anthelmintics have been continued for some time.

CLASS XIX.—DEMULCENTS.

DEMULCENTS are defined, “Medicines suited to obviate and prevent the action of acrid and stimulant matters, and that not by correcting or changing their acrimony, but by involving it in a mild and viscid matter, which prevents it from acting upon the sensible parts of our bodies,” or by covering the surface exposed to their action.

Where these substances are directly applied to the parts affected, it is easy to perceive how benefit may be derived from their application. But where they are received by the medium of the stomach into the circulating system, it has been supposed that they can be of no utility, as they must lose that viscosity on which their lubricating quality depends. Hence it has been concluded, that they can be of no service in gonorrhœa, and some similar affections. It is certain, however, that many substances which undergo the process of digestion are afterwards separated in their entire state from the blood, by particular secreting organs, especially by the kidneys; and it is possible that mucilaginous substances, which are the principal demulcents, may be separated in this manner. There can be no doubt, however, but that a great share of the relief demulcents afford in irritation or inflammation of the urinary passages, is owing to the large quantity of water in which they are diffused, by which the urine is rendered less stimulating from dilution. In general, demulcents may be considered merely as substances less stimulating than the fluids usually applied.

Catarrh, diarrhœa, dysentery, calculus, and gonorrhœa, are the diseases in which demulcents are employed. As they are medicines of no great power, they may be taken in as large quantities as the stomach can bear.

The particular demulcents may be reduced to the two subdivisions of Mucilages and Expressed Oils.

DEMULCENTS.

MIMOSA NILOTICA.
 ASTRAGALUS TRAGACANTHA.
 LINUM USITATISSIMUM.
 ALTHÆA OFFICINALIS.
 MALVA SYLVESTRIS.
 GLYCYRRHIZA GLABRA.
 CYCAS CIRCINALIS.
 ORCHIS MASCULA.
 MARANTA ARUNDINACEA.
 TRITICUM HYBERNUM.
 CORNU CERVI RASURA.
 ICHTHYOCOLLA.
 OLEA EUROPÆA.
 AMYGDALUS COMMUNIS.
 SEVUM CETI.
 CERA.

MIMOSA NILOTICA. Arabicum Gummi. Gum Arabic.
Polygam. Monœc. Lomentac. Gummi. Africa.

THIS, the purest of the gums, is obtained by spontaneous exudation from the plant. It is in small irregular pieces, white or yellowish, semipellucid, without taste or smell. It has all the properties of gum; is insoluble in alcohol or oils, and soluble in water, forming a viscid solution termed Mucilage.

Gum Arabic is used as a demulcent. In catarrh it is allowed to dissolve slowly in the mouth, and its mucilage is the basis of the mixtures usually employed to allay coughing. Its solution in water, more or less viscid, is likewise used in tenesmus, strangury, and *ardor urinæ*.

In pharmacy, mucilage of Gum Arabic is employed for a variety of purposes. It serves to suspend heavy powders in waters; it gives tenacity to substances made into pills, and it effects a partial union of oils, balsams, and resins with water.

Offic. Prep.—Emuls: Gum: Mim: Nil. Muc: Gum: Mim: Nil. *Ed.*

ASTRAGALUS TRAGACANTHA. Tragacanth. *Diadelph. Decand. Papilionaceæ. Gummi. South of Europe, Asia.*

TRAGACANTH is obtained by exudation; it is in small wrinkled pieces, semitransparent and brittle; has neither taste nor smell, and is entirely a pure gum. It is greatly superior to all the gums, in giving viscosity to water; its power in this respect being to that of gum Arabic as one to twenty-four. Its solution is not perfectly uniform, unless it be boiled for some time.

Tragacanth has virtues similar to gum Arabic. It is less employed, except in some pharmaceutical processes, in which, from its greater viscosity, it is preferred, as in making of troches.

Offic. Prep.—Mucil: Astrag: Trag. *Ed.*—P: Trag: C. *Lond.*

LINUM USITATISSIMUM. Flax. *Pentand. Pentagyn. Gruinales. Semen. Indigenous.*

THE seeds of this plant afford a mucilage by infusion or decoction in water, which has no unpleasant taste or smell. These preparations of it are, therefore, frequently used as demulcents in catarrh and gonorrhœa.

ALTHÆA OFFICINALIS. Althæa. Marsh-mallow. *Monadelph. Polyand. Columniferæ. Radix. Indigenous.*

ALL the parts of this plant yield a mucilage by infusion or decoction in water, the root most abundantly. This mucilage is similar to that from lint-seed, and is used for the same purposes.

Offic. Prep.—Decoct: Alth: Off. Syr: Alth: Off. *Ed.*

MALVA SYLVESTRIS. Common Mallow. *Monadelph. Polyand. Columniferæ. Folia. Indig.*

THE leaves of this plant afford a mucilage by infusion in water, much weaker, however, than that from lint-seed or althæa. The plant is therefore scarcely used.

GLYCYRRHIZA GLABRA. Liquorice. *Diadelph. Decand. Papilionac. Radix. South of Europe.*

THE root of this plant has a sweet agreeable taste, with no flavour. This sweetness is extracted by water by infusion or decoction, and by evaporation a dark-coloured extract of the same sweet taste is obtained, consisting principally of saccharine and mucilaginous matter. Alkohol likewise extracts the sweetness of liquorice.

Liquorice-root is a pleasant demulcent, which is frequently added to infusions of lintseed, or althæa. Its watery extract is also in common use as a demulcent in catarrh.

Offic. Prep.—Extr: Glycyrrh: Gl. Troch: Glycyrrh. Troch: Glycyrrh: cum Opio. *Ed.*

CYCAS CIRCINALIS. Sago. *Cryptogamia. Filices. East Indies.*

THIS is a fecula obtained from the pith or medullary part of the branches of the plant. It is in small grains, without taste or smell. Boiled in milk or water, it forms a nutritious jelly, often prescribed in diarrhœa as a demulcent, and in convalescence as a nutritious article of diet, easy of digestion.

ORCHIS MASCUA. Salop. *Gynand. Diand. Orchideæ. Indigenous.*

SALOP is a fecula obtained from the root of the orchis. Its qualities and virtues are similar to those of Sago.

MARANTA ARUNDINACEA. *Monand. Monogyn. Scitamineæ. South America.*

THE fecula of this plant has been lately introduced under the name of Arrow-Root Powder, as a demulcent, useful in diarrhœa and dysentery, and as a nutritious

article of diet for convalescents. It forms a jelly by boiling with water or milk.

TRITICUM HYBERNUM. Wheat. *Triand. Digyn. Gramina. Fecula Seminum. Amylum.*

STARCH, the fecula of wheat, forms a gelatinous solution when boiled with water, which is used as a demulcent. It is thus given as an enema in tenesmus, and is the common vehicle for giving opium in that form. Starch troches are likewise ordered in the London Pharmacopœia, and used as demulcent in catarrh.

Offic. Prep.—Muc: Amyli. *Ed.*—Troch: Amyli. *Lond.*

CORNU CERVI RASURA. Hartshorn Shavings. *Cervus Elaphus. Cornu. Mammal. Pecora.*

THE shavings of the horns of the deer, freed from their outer rough covering, contain, along with the phosphat of lime, a quantity of animal gelatin. This is extracted by decoction in water, and a jelly is thus obtained, which in diarrhœa and dysentery is ordered as a demulcent.

ICHTHYOCOLLA. Isinglass. *Acipenser Sturio. Pisces. Chondropterygii.*

ISINGLASS is obtained from the skin and other parts of the above, and several other kinds of fish, caught in the Northern Seas. The skin is boiled in water, and the strained decoction afterwards inspissated. The isinglass thus obtained is in dry pieces, which are again soluble in water, forming a thick mucilage, which has sometimes been employed as a demulcent.

OLEA EUROPÆA. (p. 215.)—The oil obtained from the fruit of the olive by expression, is of a light yellowish or greenish colour, without either taste or smell.

This is the expressed oil, which is most commonly used in medicine. It is employed as a demulcent in ca-

tarrh, and some other affections. It is diffused in water by the medium of mucilage, or by a very small quantity of one of the alkalies, and is thus taken in as large quantities as the stomach can bear.

AMYGDALUS COMMUNIS. Icos. Monog. Pomaceæ. Semen; Nucleus; Ol. Express. S. of Europe.

THIS oil is obtained by expression from the seeds, or by decoction of them in water. It is very similar to the olive oil, perhaps rather purer, and is used for the same purposes.

There is another mode in which this oil is given as a demulcent, that of emulsion. The almonds are triturated with water; the oil they contain is diffused in the water, by the medium of the mucilage and fecula of the almond, and a milky-like liquor is formed, which is extensively used as a pleasant demulcent.

SEVUM CETI. Spermaceti. Physter Macrocephalus. Mammalia. Cetacea.

THIS fatty matter is obtained from the head of the particular species of whale above stated. It is purified by melting and boiling with an alkaline solution. It is then in white flakes, is unctuous and friable, and has neither taste nor smell. Its chemical properties are the same as those of the expressed oils and fats, except that it does not easily unite with the alkalies. Its medicinal virtues are those of a mild demulcent, and as such it is given in catarrh and gonorrhœa, mixed with sugar, or diffused in water by the medium of the yolk of an egg.

Offic. Prep.—Cerat: Sperm: Ceti. *Lond.*

CERA. Wax.—THIS is a concrete substance of a particular nature, collected from the antheræ of vegetables by the bee. In its chemical properties it resembles most nearly the expressed oils, and in composition differs from them in containing a larger proportion of carbon. It is of a yellow colour, but by bleaching can be rendered white.

Wax has been used as a demulcent in dysentery, being diffused in water by means of mucilage of gum Arabic, but it has no particular quality to recommend it. It is much used in the composition of ointments and plasters.

Offic. Prep.—Emp: Ceræ. *Ed.*

CLASS XX.—DILUENTS.

DILUENTS are defined, those substances which increase the proportion of fluid in the blood. It is evident that this must be done by watery liquors. Water is indeed, properly speaking, the only diluent. Various additions are made to it, to render it pleasant, and frequently to give it a slightly demulcent quality. But these are not sufficiently important to require to be noticed, or to be classed as medicines.

Diluents are merely secondary remedies. They are given in acute inflammatory diseases, to lessen the stimulant quality of the blood. They are used to promote the action of diuretics in dropsy, and to favour the operation of sweating.

CLASS XXI.—EMOLLIENTS.

EMOLLIENTS are those medicines, according to the definition of Dr. Cullen, which diminish the force of cohesion in the particles of the solid matter of the human body, and thereby render them more lax and flexible. Their operation is mechanical; they are insinuated into the matter of the solid fibre, and lessen the friction between its particles. They are useful when the fibres are rigid, or when they are much extended, and therefore afford relief when topically applied to inflamed parts, to tumours distending the skin, or where the skin is dry and rigid.

Heat conjoined with moisture is the principal emollient; and water applied warm by the medium of some vegetable substances, constituting the various fomentations and cataplasms, is the form under which it is applied, the vegetable matter serving to retain the heat, and to allow the proper application of the moisture.

Oils and unctuous substances are the only other emollients; they are merely introduced by friction. Any of the expressed oils already noticed, or Lard, (*Axungia Porcina*) may be used for this purpose.

END OF VOLUME THE FIRST.

ELEMENTS
OF
MATERIA MEDICA
AND
PHARMACY.

BY J. MURRAY,
LECTURER ON CHEMISTRY, AND ON MATERIA MEDICA AND
PHARMACY.

TWO VOLUMES IN ONE.

VOL. II.

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NOTICE.

IN the pharmaceutical part of this work, I have adopted the arrangement of the Pharmacopœia of the Edinburgh College, and have adhered strictly to its nomenclature, and to the details of its processes. To convey a knowledge, however, of Pharmacy as it is practised in this country, it is necessary likewise to take notice of the preparations of the London Pharmacopœia; and the plan I have followed, while it avoids that tedious and generally useless repetition which arises from giving a complete translation of the processes of both Pharmacopœias, answers the most important purposes such a translation could serve. Wherever the *formula* of the *London* Pharmacopœia, for any preparation, differs in no essential point from that in the *Edinburgh*, I have thought it sufficient to indicate merely the name given to it in the former, which indications are enclosed in brackets. But where there is any important difference, either in proportion, composition, or mode of conducting the process, I have deemed it proper to introduce it in the text. And to the end of each chapter, I have added those preparations which are peculiar to the London Pharmacopœia, or have none corresponding to them in the publication of the Edinburgh College.

J. M.

PART III.

PHARMACY.

CHAPTER I.

PREPARATIONS OF SOME SIMPLE MEDICINES.

CARBONAS CALCIS PRÆPARATUS, *olim Creta Præparata et Cancrorum Lapilli, vulgo Oculi Cancrorum Præparati*. Prepared Carbonat of Lime, formerly Prepared Chalk, and Prepared Crabs Stones, commonly called Crabs Eyes. [Cancrorum Chelæ. Creta.]

“CARBONAT of Lime, whether the softer variety, commonly named Chalk, or the harder, called Crabs Stones and Crabs Eyes, after being rubbed to powder in an iron mortar, and levigated with a little water on a porphyry stone, is to be put into a large vessel. Water is to be poured upon it, and after the vessel has been frequently agitated, it is to be poured off, loaded with a fine powder. On the water remaining at rest, a subtile powder subsides, which is to be dried. The coarse powder which the water could not suspend, is to be again levigated, and treated in the same manner.”

Chalk is a native carbonat of lime, seldom perfectly pure. The crabs stones are concretions found in the stomach of the river craw-fish, (Cancer Astacus), consisting of carbonat of lime, with a portion of animal gelatin. By the above process, both are reduced to a very fine powder, to render them more fit for medicinal use. They are employed as antacids in a dose of one or two drachms.

Red Coral, (*Corallium Rubrum*), is ordered to be prepared in a similar manner in the London Pharmacopœia. As it has no qualities but those of carbonat of lime, there is no necessity for retaining it in the lists of the *Materia Medica*.

CARBONAS FERRI PRÆPARATUS, olim Rubigo Ferri Præparata. Prepared Carbonat of Iron, formerly Prepared Rust of Iron. [*Ferri Rubigo.*]

“Purified Filings of Iron are to be frequently moistened with water till they fall into rust, which is to be rubbed to a fine powder.”

During exposure to air and moisture, iron is oxydated, and this oxyd is found to be combined with carbonic acid, absorbed probably from the atmosphere. As a chalybeate it is more active than the pure metal, and more mild than the other saline combinations of iron. Its dose is from ten to twenty grains.

CARBONAS ZINCI IMPURUS PRÆPARATUS; olim Lapis Calaminaris Præparatus. Prepared Impure Carbonat of Zinc, formerly Prepared Calamine Stone. [*Lapis Calaminaris.*]

“Impure Carbonat of Zinc roasted by those who make brass, is to be prepared in the same manner as carbonat of lime.”

Calamine is an ore of zinc, in which sometimes the metal is merely oxydated, and in other varieties combined with carbonic acid. It is used as an application to superficial inflammation, dusted on the part, and as the basis of the common healing cerate. For these purposes, it requires to be very finely levigated.

FERRI LIMATURA PURIFICATA. Purified Filings of Iron.

“A sieve being placed over the filings, let a magnet be applied, that the filings may be drawn through the sieve upwards.”

The iron is in this manner obtained nearly pure, the interposition of the sieve in a great measure preventing particles of other metals, or impurities which are generally mixed with the iron-filings got from the workshops, from being entangled in the cluster which adheres to the magnet. The process is a very necessary one, where iron is to be medicinally employed in this form, or where it is to serve for other preparations of this metal.

FERRI OXIDUM NIGRUM PURIFICATUM, *olim Ferri Squamæ Purificatæ*. Purified Black Oxyd of Iron, formerly Purified Scales of Iron.

“Let the scales of black oxyd of iron, which are found at the anvils of the workmen, be purified by the application of the magnet; for the magnet attracts only the more small and pure scales, leaving those which are larger and less pure.”

The scales of iron are the small fragments struck off from the metal when it is heated red-hot. Passing through the atmosphere, at this temperature, they are oxydated, but so imperfectly, as to admit of this mode of purification by the magnet. They are used only in making some of the other chalybeate preparations.

OXIDUM ZINCI IMPURUM PRÆPARATUM, *olim Tutia Præparata*. Prepared Impure Oxyd of Zinc, formerly Prepared Tutty. [Tutia.]

“To be prepared as Carbonat of Lime.”

Tutty is a substance of which the origin is doubtful, but it appears to be artificial, and to consist chiefly of oxyd of zinc with argillaceous earth. It is used externally for the same purposes as calamine; and hence requires to be finely levigated.

SULPHAS ALUMINÆ EXSICCATUS, *olim Alumen Ustum*.
Dried Sulphat of Argil, formerly Burnt Alum. [Alumen Ustum.]

“ Let Sulphat of Argil be melted in an earthen or iron vessel, and exposed to the heat applied until it cease to boil.”

By this process the alum loses its water of crystallization, and becomes more active as an escharotic, for which purpose this preparation is used.

SULPHUR SUBLIMATUM LOTUM. Washed Sublimed Sulphur. [Flores Sulphuris Lot.]

“ Take of Sublimed Sulphur one pound; Water four pounds: boil the sulphur a little with the water, then pour off this water; by the affusion of cold water wash away all acid; lastly, dry the sulphur.”

A small portion of sulphur in its sublimation sometimes suffers oxydation from the air of the chamber into which it is sublimed, and hence acquires a slight acidity, which the present process is designed to remove. This is so rarely the case, however, that it is one perhaps unnecessary.

SULPHUR PRÆCIPITATUM. *Pharm. Lond.* Precipitated Sulphur.

“ Take of Sulphurated Kali (Sulphuret of Potash), six ounces; distilled water, one pound and a half; diluted vitriolic (sulphuric) acid, as much as is sufficient; boil the sulphurated kali in the distilled water until it is dissolved. Filter the liquor through paper, and add to it the diluted vitriolic acid. Wash the precipitated powder by repeated affusions of water until it become insipid.”

In this process, sulphur is first combined with potash by fusion; and this compound, dissolved in water, is decomposed by sulphuric acid, which combines with

the potash, and precipitates the sulphur. It might be supposed, therefore, to have no advantage. The sulphur, however, from its state of aggregation, is of a much whiter colour than it can be obtained by any other means, and is therefore preferable in forming an ointment for external application.

SULPHURETUM ANTIMONII PRÆPARATUM, *olim Antimonium Præparatum*. Prepared Sulphuret of Antimony, formerly Prepared Antimony. [Antimonium Præparat.]

“ Let Sulphuret of Antimony be prepared in the same manner as Carbonat of Lime.”

It has been supposed, that this substance, when finely levigated, as it is by this process, acts with more certainty than when given in a coarser powder. It is still, however, very inactive. As a remedy in chronic rheumatism, it has been given in a dose of five or ten grains daily.

MEL DESPUMATUM. Clarified Honey.

“ Liquify honey by a water-bath, and remove the scum.”

This is designed to render honey more pure, by removing completely the wax and other impurities it may contain, and which, when it is rendered liquid by heat, rise to the surface. It is seldom performed.

HERBARUM ET FLORUM EXSICCATIO. Drying of Herbs and Flowers. [Herb. et Flor. Exsiccato.]

“ Herbs and Flowers are to be dried with the gentle heat of a stove, or a common fire, in such a quantity that the drying may be done as quickly as possible; for thus their virtues are best preserved. The mark of this is their retaining completely their native colour. The leaves of hemlock, and others containing a subtile volatile matter, are, immediately after drying, to be rubbed to powder, and kept in glass vessels well stopt.”

By drying herbs and flowers, or expelling a great part of the water they contain, those chemical changes they would spontaneously suffer are prevented, and they are rendered capable of being preserved. The more quickly they are dried, they retain in general their virtues more completely. Care must be taken at the same time that too much heat be not applied, as part of their volatile principles would be dissipated, and their medicinal qualities impaired. Even when dried, they suffer some changes in keeping, probably from the action of the air; and some do so more than others. Hemlock has its colour and odour impaired in a very short time; it is therefore necessary to exclude it from the air, and likewise from exposure to light.

SCILLA MARITIMA EXSICCATA. Dried Sea Squill.
[Scill. Exsiccata.]

“Cut the root of the sea squill, its outer covering having been removed, transversely into thin slices, and dry it by a gentle heat. The mark of its being properly dried is, that although rendered friable it retains its bitterness and acrimony.”

By drying, the squill loses four-fifths of its weight, and with very little diminution of its virtues, if too much heat has not been applied. It is in this state that squill is commonly employed in medicine. Dose from one to three grains.

PULPARUM EXTRACTIO. Extraction of Pulps. [Pulparum Præparatio.]

“Boil those fruits which afford a pulp, if unripe, or if ripe and dry, with a little water, that they may become soft. Then express the pulp through a hair-sieve, and boil it with a gentle heat in an earthen vessel, stirring it frequently that it may not burn, until it attain the consistence of honey. The pulp of Cassia Fistula is to be boiled from the bruised pod; and by evaporating the water, to be reduced to the due consistence. The pulps

of ripe and fresh fruits are to be pressed through a sieve, without previous boiling."

These directions are given principally for the preparation of the pulps of several fruits, which enter into the composition of the Electuary of Senna. Pulps are seldom otherwise medicinally employed, and cannot be long preserved unchanged.

Under the Chapter corresponding with this in title in the London Pharmacopœia, are several additional preparations, of which it may be necessary to take notice.

AMMONIACI PURIFICATIO. Purification of Gum Ammoniac.

"If ammoniac seem not pure, boil it in water, until it soften; and by a press, force it through an hempen bag; then put it aside, that the resinous matter may subside. Evaporate the water, mixing towards the end of the evaporation the resinous with the gummy part.

"Assafœtida and other similar gum-resins may be purified in the same manner.

"Any gum also, which melts easily, such as Galbanum, may be purified by putting it into an ox-bladder, and keeping it in boiling-water, till it become so soft that it may be pressed through a strong linen-cloth, and freed from its impurities."

By such processes, the qualities of the substances are always injured, and they are unnecessary, since these gums, when not sufficiently pure, ought not to be used.

STYRACIS PURIFICATIO. Purification of Storax.

"Having dissolved Storax in alcohol, strain the liquor, and distil it with a gentle heat to a proper consistence."

This is equally unnecessary with the preceding.

CORNU CERVI USTIO. Burning of Hartshorn.

“Burn pieces of hartshorn till they become perfectly white, then rub them to a very fine powder.”

Animal bones consist of gelatin with phosphat of lime; by burning, the former is destroyed, the latter remains. It was considered as an antacid, but it cannot be referred to that class. It is sometimes an ingredient in dentifrice compositions.

MILLEPEDÆ PRÆPARATIO. Preparation of Millepedes.

“Suspend slaters, inclosed in a thin linen-bag, over proof-spirit, heated in a close vessel, that they may be killed by the vapour, and rendered friable.”

It is singular that this absurd preparation should have been so long retained in our Pharmacopœias as it has been.

SPONGIÆ USTIO. Burning of Sponge.

“Bruise sponge cut into small pieces, and, when freed from stony matter, burn it in a close iron vessel until it become black and friable. Then rub it into a fine powder.”

Burnt sponge consists chiefly of carbonaceous matter, with a small portion of carbonat of soda. It has been celebrated as a remedy in scrofula, in a dose of a scruple or half a drachm.

CHAPTER II.

CONSERVÆ.—CONSERVES.

IN these preparations, vegetable matter bruised is mixed with about three times its weight of sugar, and beat into an uniform pulpy mass. It was supposed that the sugar, by its antiseptic quality, would prevent the decomposition of the vegetable matter. This, however, is not the case. This form of preparation, therefore, is not applied to any active medicine, the few conserves that are retained being employed merely as vehicles for other medicines, and for giving them convenient forms. The conserves in the Edinburgh Pharmacopœia are the following: *CONSERVA Corticis exterioris recentis fructûs CITRI AURANTII, Radulâ abrasi:* [Conserv. Aurantii His. cort. cter.] Conserve of the Outer Rind of the Orange rasped by a Grater. *CONSERVA Fructûs ROSÆ CANINÆ maturi, a seminibus eorumque pube sollicitè purgati:* [Conserv. Cynosbati.] Conserve of the Fruit of Dog-hips carefully freed from the Seeds and included Down. *CONSERVA Petalorum ROSÆ GAL-LICÆ nondum explicitorum:* [Conserv. Rosæ rubræ.] Conserve of the Unblown Petals of the Red Rose. In each of these, the vegetable substance is beat into a pulp, adding gradually, during the beating, three times its weight of sugar.—To these the London College add, *CONSERVA ABSINTHII MARITIMI*, Conserve of Sea Wormwood; *CONSERVA LUJULÆ*, Conserve of Wood Sorrel; *CONSERVA ARI*, Conserve of Arum; *CONSERVA PRUNI SYLVESTRIS*, Conserve of Sloes; *CONSERVA SCILLÆ*, Conserve of Squill;—preparations which scarcely require any particular notice. To the first the form of conserve is very ill adapted; and in the last, the active matter of the squill cannot be preserved long by this preparation.

CHAPTER III.

SUCCI.—JUICES.

VEGETABLE Juices are obtained by expression. They consist of various proximate principles of the plant, particularly of mucilage, extractive matter, tannin, fecula, and some saline substances dissolved or suspended in water, and when recent, may possess the medicinal virtues which belong to any of these principles. It is impossible, however, to preserve vegetable matter in solution in water for any length of time without suffering decomposition; and hence juices are unfit for officinal preparations. Only one is retained in the Edinburgh and London Pharmacopœias, and it might have been discarded.

SUCCUS COCHLEARIÆ OFFICINALIS COMPOSITUS.

Compound Juice of Scurvy-Grass. [Succus Cochlea. com.]

“ Take of Juice of Scurvy-Grass, Juice of Water-Cresses expressed from fresh-gathered herbs, Juice of the Fruit of the Orange, of each two pounds; Spirit of Nutmeg half a pound: mix and put aside until the impurities have subsided; then pour off the liquor.”

This juice was at one time celebrated as a remedy in scurvy, from four to eight ounces being taken twice or thrice a-day; but since the powers of the citric acid have been fully ascertained, it is very seldom prescribed, and is never kept in the shops.

CHAPTER IV.

SUCCI SPISSATI, VULGO EXTRACTA.—INSPISSATED
JUICES, COMMONLY TERMED EXTRACTS.

WHERE the virtues of any vegetable reside in a principle which is contained in the juice obtained from it by expression, and where this principle is at the same time not volatile, inspissation by a moderate heat will contribute to its preservation, as the soft mass obtained by this process is much less liable to chemical changes than when the reaction of its constituent parts is favoured by dilution with water. The preparation, however, is still liable to disadvantages. By the heat employed in the inspissation, part of its active matter is generally dissipated, and another source of injury is derived from the oxygenation which the extract is liable to suffer when thus heated in contact with the atmospheric air; and the preparation itself being still soft and humid, must gradually undergo chemical alterations. Hence, inspissated juices are generally variable in their medicinal qualities.

The process for these preparations is described in the Edinburgh Pharmacopœia under the first of them.

SUCCUS SPISSATUS ACONITI NAPELLI. Inspissated
Juice of Aconite or Wolfsbane.

“The fresh leaves of the aconite are to be bruised, and being inclosed in an hempen bag, are to be pressed strongly, that they may give out their juice, which is to be reduced by evaporation in open vessels, heated by boiling water saturated with muriat of soda, to the consistence of thick honey. The mass, after it has cooled, is to be kept in glazed earthen vessels, and moistened with alkohol.”

This inspissated juice is the form under which wolfsbane has been usually administered. It has been given principally in obstinate chronic rheumatism, in a dose of half a grain night and morning, and gradually increased to five or six grains.

In the same manner are prepared the following Inspissated Juices from the leaves of their respective plants.

SUCCUS SPISSATUS ATROPÆ BELLADONNÆ. Inspissated Juice of Deadly Night-Shade.

This has been recommended in scirrhus and some convulsive affections, in a dose of one grain, gradually increased.

SUCCUS SPISSATUS CONII MACULATI. Inspissated Juice of Hemlock. [Succus Spissat. Cicutæ.]

Under this form, hemlock was employed by Störck in scirrhus and cancer. The dose given is at first two grains, but it can be largely increased, and has at length been taken to the extent of several drachms in the day. In the preparation of it, the narcotic power of the hemlock seems always to be more or less impaired, and it is injured by keeping. It is, therefore, uncertain with regard to strength, more so, perhaps, than the dried leaves of the plant.

SUCCUS SPISSATUS HYOSCYAMI NIGRI. Inspissated Juice of Black Henbane.

This plant resembling opium in its powers, has been employed frequently as a substitute for it. The dose is one grain, which requires, if continued, to be increased.

SUCCUS SPISSATUS LACTUCÆ VIROSÆ. Inspissated Juice of Strong-scented Lettuce.

This preparation was recommended as a remedy in dropsy by the German practitioners, in a dose of four or five grains, gradually increased to one or two drachms in twenty-four hours. It has been little used in this country.

SUCCUS SPISSATUS SAMBUCCI NIGRÆ, *vulgo Rob Sambuci*. Inspissated Juice, or Rob of Elder. [*Succ. Spissat. Baccæ Samb.*]

The preparation of this is peculiar. "Five pounds of the juice of Elder Berries, and one pound of Sugar, are to be boiled with a gentle heat to the consistence of thick honey."

It has been given as an aperient or moderate laxative and diuretic in a dose of half an ounce, or one ounce. It possesses no quality to recommend it. In the preparation of it in the London Pharmacopœia, it is merely inspissated without sugar.

SUCCUS SPISSATUS MOMORDICÆ ELATERII, *vulgo Elaterium*. Inspissated Juice of Wild Cucumber, or Elaterium. [*Elaterium*.]

"Cut the ripe fruit of the wild cucumber, and pass through a very fine hair-sieve the juice lightly expressed; boil it a little, and set it aside for some hours until the thicker parts subside. Pour off the thinner part which floats above, and separate the rest by straining. The thicker part which remains after the straining, being covered with a linen cloth, is to be dried by a gentle heat."

This is not, properly speaking, an inspissated juice, but is considered rather as a fecula. It is a very violent cathartic, operating powerfully in a dose of one or two grains. It has been used as a hydragogue in dropsy, and as a cathartic in obstinate constipation, where others have failed. The violence, and in some measure the uncertainty of its operation, prevent its frequent use.

THE additional preparations of this kind in the London Pharmacopœia are *SUCCUS SPISSATUS RIBIS NIGRI*, Inspissated Juice of Black Currant, and *SUCCUS SPISSATUS LEMONIS*, Inspissated Juice of Lemon, which require no particular observation.

CHAPTER V.

OLEA FIXA.—FIXED OILS.

THE chemical properties of these oils have already been described. They exist unmixed in the fruit and seeds of vegetables, and are obtained by expression, or decoction with water. The former is in general to be preferred; and to afford the oil pure it must be performed without heat, which, though it favours the separation of the oil, communicates to it an unpleasant flavour. To preserve them from becoming rancid, they ought to be kept secluded from the air.

A process in pharmacy somewhat difficult is to mix these oils with any watery fluid, so that they may be conveniently exhibited. It is usually done by the medium of mucilage, or of an alkali. If triturated with mucilage, and a small quantity of sugar, the oil is diffused through the water, and a milky liquor formed. A combination still more permanent is effected, by adding a few drops of water of ammonia, or two or three grains of carbonat of potash.

The directions for preparing these oils in the Edinburgh Pharmacopœia, are given under the Oil of Almonds.

OLEUM AMYGDALÆ COMMUNIS. [*Oleum Amygdalæ.*]

“Take of Fresh Almonds any quantity. Bruise them in a stone mortar, inclose them in an hempen bag, and express the oil by a press without heat.”

The oil thus obtained is the purest of the expressed oils, being entirely free from odour or taste, and is used for the general medicinal purposes of expressed oils.

In the same manner is to be expressed *OLEUM LINI USITATISSIMI*, [*Ol. e semin. Lini.*] Oil of Lintseed, from the seeds of the plant. Being rather less pure, it is used only as an external application.

To these the London College add *OLEUM RICINI*, Castor Oil, and *OLEUM SINAP EOS*, Oil of Mustard. The former is usually prepared, however, in the West Indies by decoction, and is milder than when obtained by expression; and the latter is scarcely applied to any use. The olive oil, which of all the expressed oils is most largely employed, is imported from the South of Europe.

CHAPTER VI.

EMULSIONES.—EMULSIONS.

EMULSIONS are preparations in which the expressed oil of seeds or kernels is suspended in water by the medium of the mucilage, and perhaps also of the fecula which the seeds contain. They are always opaque and milky: as the oil is merely diffused through the water, it gradually collects and rises to the surface: and owing to the vegetable matter dissolved in the liquor, they are also liable to become sour. They likewise suffer decomposition from vinous spirits or acids.

EMULSIO AMYGDALÆ COMMUNIS. Almond Emulsion.
[*Lac Amygdalæ*.]

“Take of Sweet Almonds one ounce; Water two pounds and a half; beat the blanched almonds carefully in a stone-mortar, adding the water gradually, then strain.”

This is used merely as a demulcent in catarrh and gonorrhœa, or during the application of a blister, being drunk *ad libitum*.

EMULSIO GUMMI MIMOSÆ NILOTICÆ, *vulgo Emulsio Arabica*. Arabic Emulsion.

“ This is made in the same manner, adding, while beating the almonds, two ounces of mucilage of gum Arabic.”

It is used in the same cases as the preceding, and is supposed to have a greater share of demulcent power.

EMULSIO CAMPHORATA. Camphor Emulsion.

“ Take of Camphor one scruple; blanched Sweet Almonds two drachms; Refined Sugar one drachm; Water six ounces: to be made in the same manner as the Almond Emulsion.”

Camphor is less apt to induce nausea when given in liquid than when in a solid form; and this is one of the best forms of preparation. Its dose is two ounces.

CHAPTER VII.

INFUSA.—INFUSIONS.

INFUSION is a term employed in Pharmacy, to denote that operation in which water on remaining for some time on vegetable matter dissolves part of it; and also to express the preparation which results from that operation. It is obvious, that infusion, understood in this sense, can be applied with propriety only to those plants whose virtues depend on principles soluble in water. The strength of the infusion is considerably influenced by the temperature of the fluid, hot water dissolving more of the soluble matter than cold, while cold water, from this circumstance, frequently affords a preparation which, if weaker, is more grateful. From dried vegetables, the soluble matter is in general more easily obtained than from those which are recent. Infusions are always ex-

temporaneous preparations, and cannot be preserved in a sound state for more than a few days.

INFUSUM CINCHONÆ OFFICINALIS. Infusion of Peruvian Bark.

“Take of Powdered Peruvian Bark, one ounce; Water, one pound. Macerate them for twenty-four hours, and strain.”

By simple infusion, water is capable of dissolving only a small portion of the active matter of bark. This preparation is used principally in dyspepsia, in a dose of two ounces occasionally.

INFUSUM DIGITALIS PURPUREÆ. Infusion of Foxglove.

“Take of the dried leaves of Foxglove, one drachm; Boiling water, eight ounces; Spirit of Cinnamon, one ounce. Macerate for four hours, and strain.”

Infusion is the form under which Dr. Withering, who introduced the use of digitalis in dropsy, recommended it to be given. The dose is half an ounce taken twice a-day, and gradually increased till the effects of the remedy appear.

INFUSUM GENTIANÆ LUTEÆ COMPOSITUM, *vulgo Infusum Amarum*. Compound Infusion of Gentian. [Infusum gentianæ compositum.]

“Take of Gentian Root, half an ounce; Dried Orange-peel, one drachm; Coriander Seeds, half a drachm; Diluted alcohol, four ounces; Water, one pound. First pour on the alcohol, and after three hours the water; then macerate without heat for twelve hours, and strain.”

This bitter infusion is employed in dyspepsia, and is much better adapted to continued use than the bitter tinctures. Its dose is two ounces occasionally.

INFUSUM MIMOSÆ CATECHU, *vulgo Infusum Japonicum.*
Infusion of Catechu.

“Take of Extract of Catechu, two drachms and a half; Bark of Cinnamon, half a drachm; Boiling Water, seven ounces; Simple Syrup, one ounce. Macerate the extract and bark with the water in a closed vessel for two hours, then strain, and add the syrup.”

The Extract of Catechu is completely soluble in water. This preparation, therefore, possesses all its virtues uninjured, and rendered more grateful, by the addition of the cinnamon. Its principal use is in diarrhœa. Its dose, one ounce every third or fourth hour.

INFUSUM RHEI PALMATI. Infusion of Rhubarb.

“Take of the Root of Rhubarb, half an ounce; Boiling Water, eight ounces; Spirit of Cinnamon, one ounce. Macerate the root with the water in a closed vessel for twelve hours, then, adding the spirit, strain the liquor.”

The infusion of rhubarb is supposed to have more of the purgative than of the astringent power. It is accordingly used as a mild cathartic. Dose, two ounces.

INFUSUM ROSÆ GALLICÆ. Infusion of Red Rose.
[Infus. Rosæ.]

“Take of the Dried Petals of the Red Rose, two ounces; Boiling Water, five pounds; Sulphuric Acid, one drachm; Refined Sugar, two ounces. Macerate the petals with the boiling water in an earthen vessel, which is not glazed with lead, for four hours; then having poured on the acid, strain the liquor, and add the sugar.”

This infusion is used principally as a moderately astringent gargle, in slight cases of cynanche. It owes little else than colour, and a pleasant flavour, to the petals of the rose; the astringency depending almost entirely on the sulphuric acid.

INFUSUM TAMARINDI INDICÆ CUM CASSIA SENNA.
Infusion of Tamarind and Senna.

“ Take of the Prepared Fruit of the Tamarind, one ounce; Senna Leaves, one drachm; Coriander Seeds, half a drachm, Unrefined Sugar, half an ounce; Boiling Water, eight ounces: Macerate them in a close earthen vessel, which is not glazed with lead, shaking frequently, and after four hours strain the liquor. It may be made also with double or triple the quantity of senna.”

This combination affords a very pleasant purgative, mild in its operation. The whole quantity may be taken at intervals as a dose. If we wish a more powerful cathartic, it must be made with an increased proportion of senna.

IN the London Pharmacopœia are two infusions, both of Senna. The first, INFUSUM SENNÆ SIMPLEX, (prepared from Senna, an ounce and a half; Ginger, one drachm; and Boiling Distilled Water, one pint; macerated for an hour, and strained), is given as a cathartic, in a dose to an adult from two to four ounces. The second, INFUSUM SENNÆ TARTARISATUM, is prepared, from Senna, one ounce and a half; Coriander Seeds bruised, half an ounce; Acidulous Tartarite of Potash, two drachms; and Distilled Water, one pint; the Crystals of Tartar being dissolved in the water by boiling, and the hot liquor being poured on the senna and coriander: the maceration being continued for an hour, in a covered vessel, and strained when cold. It is similar to the infusion of senna and tamarinds, rather less pleasant, but having the recommendation of cheapness. From the larger proportion of senna it is also more active. Dose from two to four ounces.

UNDER the Chapter entitled *Infusa*, in the Edinburgh Pharmacopœia, are several preparations which cannot properly be ranked as infusions. The first is an example of a Mixture.

POTIO CARBONATIS CALCIS, *olim Potio Cretacea.*
Chalk Potion. [Mist. Cretacea.]

“Take of Prepared Carbonat of Lime, one ounce; Refined Sugar, half an ounce; Mucilage of Gum Arabic, two ounces. Rub them together, and add gradually of Water, two pounds and a half; Spirit of Cinnamon, two ounces.”

The chalk in this mixture is merely suspended by the mucilage. It is used as an antacid, one or two ounces being taken occasionally.

With this may be noticed a few Mixtures which find a place in the London Pharmacopœia.

MISTURA CAMPHORATA. Camphorated Mixture.

“Take of Camphor, one drachm; Rectified Spirit of Wine, a little; Refined Sugar, half an ounce; Boiling Distilled Water, one pint. Rub the camphor with the spirit, afterwards with the sugar; add the water gradually, and strain the mixture.”

The use of boiling water in this mixture is injudicious, as it volatilizes part of the camphor, and as it dissolves it in less proportion than when cold. It is given as a stimulant, in the dose of one ounce every second or third hour, in fever accompanied with debility.

MISTURA MOSCHATA. Musk Mixture.

“Take of Musk, two scruples; Powdered Gum Arabic, Refined Sugar, of each one drachm; Rose Water, six ounces. Rub the musk with the sugar, then with the gum, and add the rose water gradually.”

This is a convenient form for the exhibition of musk. The dose is one ounce, or an ounce and a half.

LAC AMMONIACI. Milk of Gum Ammoniac.

“Take of Gum Ammoniac, two drachms; Distilled water, half a pint: Triturate the gum-resin with the water poured on gradually, until it become an emulsion.”

In this mixture the resin and oily matter is suspended in the water by the medium of the gum, and a milky-like fluid formed, from which the resin gradually subsides. It is given as an expectorant, in a dose from half an ounce to an ounce at a time.

LAC ASSAFOETIDÆ.

THIS is prepared in the same manner. It is the resin of the assafœtida suspended by the intervention of the gum. In hysteria, it is given in a dose of half an ounce or an ounce, frequently repeated during the paroxysm.

MUCILAGO AMYLI. Starch Mucilage. *Phar. Ed.* [Mucilago Amyli.]

“Take of Starch, half an ounce; Water, one pound. Rub the Starch, adding gradually the water; then boil them for a short time.”

Fecula, of which wheat-starch is a variety, is soluble in boiling water, and forms a gelatinous solution. This starch-mucilage is principally used as a vehicle for giving opium, or other remedies, under the form of enema.

MUCILAGO ASTRAGALI TRAGACANTHÆ. Mucilage of Gum Tragacanth. [Mucilago Tragacanthæ.]

“Take of Gum Tragacanth beat to powder, one ounce; Boiling Water, eight ounces. Macerate for twenty-four hours, and rub the gum carefully, that it may be dissolved; then strain it through linen.”

This gum gives a very viscid consistence to water; the mucilage, with the above proportion, is gelatinous, and is used principally in making troches.

MUCILAGO MIMOSÆ NILOTICÆ. Mucilage of Gum Arabic. [Mucilago Arabici Gummi.]

“Take of Powdered Gum Arabic, one part; Boiling Water, two parts. Digest with frequent agitation until the gum be dissolved; then strain through linen.”

This is the mucilage that is usually employed for pharmaceutical purposes; such as suspending substances insoluble in water, rendering oils miscible with watery liquors, &c. It is also used as a demulcent.

MUCILAGO SEMINUM CYDONII MALI. *Lond.* Mucilage of Quince Seed.

“Take of Quince Seeds, one drachm; Distilled Water, eight ounces. Boil with a gentle heat for ten minutes, and strain through linen.”

This mucilage is little employed, having no particular advantage, and being liable to spontaneous decomposition.

AQUA CALCIS. Lime Water. [Aq. Calcis.]

“Take of Lime recently prepared, half a pound: Put it into an earthen vessel, and sprinkle it with four ounces of water, keeping the vessel closed while the lime becomes hot, and falls into powder; then pour on twelve pounds of water, and mix the lime with it by agitation. After the lime has subsided, repeat the agitation; and do so about ten times, keeping the vessel always shut, that the free access of the air may be prevented. Let the water be strained through paper, interposing between the filter and the funnel glass-rods, that the water may pass through as quickly as possible. Let it be kept in bottles well stopt.”

The caution to exclude the air in this process, arises from the supposition that the lime would combine rapidly with the carbonic acid of the atmosphere. After the solution is strained, it is at least necessary that it should be kept in vessels well stopt. A very small quantity only of lime is dissolved, about two grains to the ounce. The solution has a styptic taste. It is used as a tonic and astringent. Dose from one to two pounds daily.

CHAPTER VIII.

DECOCTA.—DECOCTIONS.

By *Boiling* vegetable substances in water, their active matter is more abundantly dissolved than by simple infusion. The preparation thus obtained is termed a Decoction.

In a number of cases, part of the matter dissolved by the assistance of the high temperature separates as the liquor cools, especially where it is of a resinous matter; in others, however, it is retained.

Though a larger portion of matter is dissolved by the water in this mode of preparation, yet it cannot be always advantageously employed. Wherever the virtues of the substance subjected to it depend, in whole or in part, on any volatile principle, they are necessarily injured by this being dissipated. At the temperature of 212° , humid extractive matter combines too with oxygen from the atmospheric air; and perhaps at the same temperature, some vegetable principles suffer decomposition from the reaction of their constituent parts: hence many vegetables suffer injury from boiling, even where this cannot be ascribed to the dissipation of their volatile parts. These circumstances limit considerably the application of this form of preparation.

Decoctions are always extemporaneous preparations. In general, during the boiling the air should be excluded, and the liquor ought to be strained while hot.

DECOCTUM ALTHÆÆ OFFICINALIS. Decoction of
Althæa.

“ Take of Dried Althæa root, four ounces; Raisins freed from their seeds, two ounces; Water, seven pounds. Boil to five pounds; put aside the strained liquor until the impurities have subsided, and pour off the clear liquor.”

The gum of vegetables is not injured by decoction.

As the virtues of the althæa depend on this principle, they are obtained entire in this preparation. It is used as a demulcent, being taken *ad libitum*.

DECOCTUM ANTHEMIDIS NOBILIS, *vulgo Decoctum Chamæmeli sive Commune*. Decoction of Chamomile, or Common Decoction.

“Take of the Dried Flowers of Chamomile, one ounce; Caraway Seeds, half an ounce; Water, five pounds. Boil for a quarter of an hour, and strain.”

This decoction is designed to be used principally as an enema and fomentation. Similar preparations are inserted in the London Pharmacopœia, under the names of DECOCTUM PRO ENEMATE, and DECOCTUM PRO FOMENTO.

DECOCTUM CINCHONÆ OFFICINALIS, *vulgo Decoctum Corticis Peruviani*. Decoction of Peruvian Bark. [Decoctum Cinchonæ.]

“Take of Peruvian Bark in powder, one ounce; Water, one pound and a half. Boil for ten minutes in a covered vessel, and strain the liquor while hot.”

As the active part of Peruvian bark is chiefly resinous-extractive matter, part of it dissolved by the hot water is deposited as the liquor cools. Hence the necessity of straining it while hot. As the same matter suffers oxygenation during boiling, the propriety is obvious of continuing the boiling for a short time only, and in a close vessel. This decoction is given in general when bark in considerable doses is requisite, and where the powder does not remain on the stomach. The dose is two ounces repeated occasionally.

DECOCTUM DAPHNES MEZEREI. Decoction of Meze-reon.

“Take of the Bark of the Root of Mezereon, two drachms; of Licorice Root bruised, half an ounce; Water, three pounds. Boil with a gentle heat to two pounds, and strain.”

The use of the liquorice is to cover the pungency of the mezereon. The decoction is given in a dose of six or eight ounces, three or four times a day, in the cases in which mezereon is employed, principally in the secondary symptoms of syphilis.

DECOCTUM GEOFFRÆÆ INERMIS. Decoction of Cabbage-Tree Bark.

“ Take of Cabbage-Tree Bark in powder, one ounce; Water, two pounds. Boil with a gentle heat to one pound, and strain.”

Decoction has been the form under which this medicine has been usually exhibited. It is given as an anthelmintic in a dose of two ounces to an adult.

DECOCTUM GUAJACI OFFICINALIS COMPOSITUM, *vulgo Decoction Lignorum*. Compound Decoction of GUAJAC.

Take of Guaiac Wood Shavings, three ounces; Raisins, two ounces; Sassafras Root, Liquorice Root, of each one ounce; Water, ten pounds. Boil the water with the guaiac wood, and raisins, on a gentle fire, to five pounds, adding the roots towards the end of the boiling; then strain without expression.”

Under this form guaiac wood is administered as a remedy in cutaneous diseases, and sometimes in chronic rheumatism. It is taken to the extent of two or three pounds daily.

DECOCTUM HORDEI DISTICHI. Decoction of Barley [Decoction Hordei.]

“ Take of Pearl Barley, two ounces; Water, five pounds. First wash off with cold water the flour adhering to the barley; then boil the barley for a short time with about half a pound of water, to extract the colouring matter. This being rejected, put the barley thus purified

into five pounds of boiling water. Boil this to one half, and strain."

This decoction is used merely as a diluent in febrile affections. A similar formula, in which figs, raisins and liquorice, are added to the barley, is inserted in the London Pharmacopœia, under the title of *DECOCTUM HORDEI COMPOSITUM*.

DECOCTUM POLYCALÆ SENEGÆ. Decoction of Seneka.

"Take of Seneka Root, one ounce; Water, two pounds. Boil to sixteen ounces, and strain."

This has been used as a remedy in chronic rheumatism, and sometimes as an expectorant in pneumonia. Its dose is two or three ounces, three or four times a-day.

DECOCTUM SMILACIS SARSAPARILLÆ. Decoction of Sarsaparilla. [*Decoction Sarsaparillæ.*]

"Take of Sarsaparilla Root cut, six ounces; Water, eight pounds. Digest for two hours, in a temperature of about 195°, then take out the root and bruise it; put it again into the liquor, and boil it with a gentle fire to two pounds; then express it, and strain."

Under this form sarsaparilla has been given in the secondary symptoms of syphilis. It is probably to be regarded only as belonging to the nutrientia; and as such, when taken largely, it may be of some advantage. It has been given also in dysuria.



A few decoctions which have a place in the London Pharmacopœia remain to be noticed.

DECOCTUM CORNU CERVI. Decoction of Hartshorn.

"Take of Burnt and Prepared Hartshorn, two ounces; Gum Arabic, six drachms; Distilled Water, three

pounds. Boil, stirring constantly, to two pounds, and strain."

The burnt hartshorn, consisting chiefly of phosphat of lime, is insoluble in water. In this useless preparation, therefore, the gum Arabic only is dissolved.

DECOCTUM HELLEBORI ALBI. Decoction of White Hellebore.

"Take of White Hellebore Root in powder, one ounce; Distilled Water, two pints; Rectified Spirit of Wine, two ounces. Boil the water with the root to one pint; when the liquor is cold, strain, and add the spirit."

This is used as an external application in some cutaneous diseases, principally in psora.

DECOCTUM SARSAPARILLÆ COMPOSITUM. Compound Decoction of Sarsaparilla.

"Take of Sarsaparilla Root, slit and bruised, six ounces; Bark of Sassafras Root, Shavings of Guaiac Wood, Liquorice Root bruised, of each one ounce; Mezereon, three drachms; Distilled Water, ten pints. Macerate with a gentle heat for six hours; boil to five pints, adding the mezereon towards the end of the boiling; then strain."

This decoction is an improvement of the Lisbon Diet-Drink, once highly celebrated for its power in removing some of the secondary symptoms of syphilis, and promoting the action of mercury. Its dose is four or six ounces three or four times a-day. From Dr. Russell's experiments, its efficacy appears to depend on the mezereon.

DECOCTUM ULMI. Decoction of Elm.

"Take of the Bark of the Elm, fresh bruised, four ounces; Distilled Water, four pints. Boil to two pints, and strain."

This decoction has been recommended as a remedy in cutaneous diseases.

CHAPTER IX.

SYRUPÆ.—SYRUPS.

SYRUPS are solutions of sugar in water either pure, or containing other substances dissolved. They are seldom active medicines; but are principally designed to render others pleasant. The proportion of sugar with which they are generally made is about two parts to one of fluid.

SYRUPUS SIMPLEX *sive Communis*. Simple or Common Syrup.

“Take of Refined Sugar beat to powder, fifteen parts; Water, eight parts. Dissolve the Sugar with a gentle heat, and boil a little so as to form a syrup.”

This solution of sugar is used merely to communicate sweetness of taste.

SYRUPUS ACIDI ACETOSI.

“Take of Acetous Acid, two pounds and a half; Refined Sugar, three pounds and a half. Boil so as to form a syrup.”

This acidulous syrup being sufficiently pleasant, may enter into mixtures in which it cannot occasion any chemical decomposition.

SYRUPUS ALTHÆÆ OFFICINALIS. Syrup of Althæa.
[Syrup. Althææ.]

“Take of Fresh Althæa Root cut, one pound; Water, ten pounds; Refined Sugar, four pounds. Boil the water with the root to one half, and expressing it strongly, strain. Put aside the strained liquor, that the impurities may subside, and to the purified liquor add the sugar; then boil it so as to form a syrup.”

The quantity of mucilage this syrup can contain is so trifling, that it cannot be considered as receiving from it any virtue.

SYRUPUS AMOMI ZINGIBERIS. Syrup of Ginger.
[Syrup. Zinziber.]

“Take of the Root of Ginger, beat, three ounces; Boiling Water, four pounds; Refined Sugar, seven pounds and a half. Macerate the root in the water, in a close vessel for twenty-four hours; and, to the strained liquor, add the beat sugar, so as to make a syrup.”

The flavour of the ginger renders this syrup sufficiently pleasant; it is therefore not unfrequently used.

SYRUPUS CITRI AURANTII. Syrup of Orange-peel.
[Syrup. Cortic. Aurant.]

“Take of the Fresh Outer Rind of the Orange, six ounces; Boiling Water, three pounds; Refined Sugar, four pounds. Macerate the rind in water for twelve hours; then to the strained liquor add the sugar beat to powder, and, by the application of a gentle heat, form a syrup.”

This syrup, like the former, is used merely on account of its grateful aromatic flavour.

SYRUPUS CITRI MEDICÆ, *olim Syrupus Limonum*.
Syrup of Lemon. [Syrup. Limonis Succ.]

“Take of the Juice of Lemons strained after the impurities have subsided, three parts; Refined Sugar, five parts; dissolve the sugar so as to form a syrup.”

This pleasant syrup is used to sweeten and acidulate mixtures, especially those of the mucilaginous kind.

SYRUPUS COLCHICI AUTUMNALIS. Syrup of Colchicum.

“Take of the Fresh Root of Colchicum, cut into small pieces, one ounce; Acetous Acid, sixteen ounces;

Refined Sugar, twenty-six ounces. Macerate the root in the acid for two days, shaking the vessel occasionally; then expressing it gently, strain it; to the strained liquor add the sugar, and boil a little, so as to form a syrup."

Colchicum has been used under this form as a diuretic in dropsy. The dose of the syrup is half an ounce or six drachms.

SYRUPUS DIANTHI CARYOPHILLI. Syrup of Clove
July-Flower. [Syrup. Caryophill. Rub.]

"Take of the Fresh Petals of the Clove July-Flower freed from the heels, one pound; of Boiling Water, four pounds; of Refined Sugar, seven pounds. Macerate the petals in the water for twelve hours; then to the strained liquor add the beat sugar; which dissolve with a gentle heat, so as to form a syrup."

This syrup is valued principally on account of its deep red colour. Its flavour also is pleasant.

SYRUPUS PAPAVERIS SOMNIFERI. Syrup of White
Poppy. [Syrup. Papav. Alb.]

"Take of the Dried Capsules of the White Poppy, freed from the seeds, two pounds; Boiling Water, thirty pounds; Refined Sugar, four pounds. Macerate the sliced capsules in the water for twelve hours; then boil until a third part only of the liquor remain; and pressing it strongly, strain; boil down the strained liquor to one half, and again strain; lastly, the sugar being added, boil a little, so as to form a syrup."

The capsules of the poppy possess the narcotic power of the plant; and the matter in which this resides is soluble in water. In this preparation, therefore, it is extracted. The syrup is given as an anodyne principally to children. The dose to a child a year old is one drachm. It is uncertain in its strength. The Dublin College have substituted for it a syrup of opium.

SYRUPUS RHAMNI CATHARTICI. Syrup of Buckthorn.
[Syrup. Spinæ Cervinæ.]

“Take of the Clarified Juice of ripe Buckthorn Berries, two parts; Refined Sugar, one part. Boil, so as to form a syrup.”

This syrup is used as a cathartic; the dose to an adult is an ounce, or an ounce and a half.

SYRUPUS ROSÆ GALLICÆ. Syrup of Red Rose.

“Take of the Dried Petals of the Red Rose, seven ounces; Boiling Water, five pounds; Refined Sugar, six pounds. Macerate the petals in water for twelve hours; then boil them a little, and strain; to the strained liquor add the sugar, and again boil, so as to form a syrup.”

In this preparation the slight astringency of the red rose is supposed to be preserved; and where a syrup having this quality is indicated, this is generally preferred.

SYRUPUS ROSÆ CENTIFOLIÆ. Syrup of Damask or Pale Rose. [Syrup. Rosæ.]

“Take of the Fresh Petals of the Damask Rose, one pound; Boiling Water, four pounds; Refined Sugar, three pounds. Macerate the petals in water for twelve hours; then to the strained liquor add the sugar, and boil, so as to form a syrup.”

This syrup is a very mild purgative, and, as such, is given to children in a dose of two or three tea-spoonfuls.

SYRUPUS SCILLÆ MARITIMÆ. Syrup of Squill.

“Take of the Vinegar of Squill, two pounds; Refined Sugar, three pounds and a half. Dissolve the sugar with a gentle heat, so as to form a syrup.”

This is an active remedy, and is the form under which squill is generally given as an expectorant. Its dose is one or two drachms. It is also given to children as an emetic, especially in pertussis.

SYRUPUS TOLUIFERÆ BALSAMI, *vulgo Syrupus Balsamicus*. Syrup of Tolu Balsam. [Syrup. Tolutan.]

“Take of Common Syrup, two pounds; Tincture of Tolu Balsam, one ounce. With the syrup newly prepared, and removed from the fire, when it has nearly cooled, mix the tincture gradually with agitation.”

This syrup, according to the formula of the London College, is prepared by boiling the Balsam of Tolu in water, and dissolving the sugar in this liquor. Prepared in either way, it can be valued only on account of its flavour.

SYRUPUS VIOLÆ ODORATÆ. Syrup of Violet. [Syrup. Violæ.]

“Take of the fresh flowers of the Sweet-scented Violet, one pound; Boiling Water, four pounds; Refined Sugar, seven pounds and a half. Macerate the flowers in water for twenty-four hours in a covered glass or earthen vessel. Then strain, without expression, and to the strained liquor, add the beat Sugar, so as to form a syrup.”

This syrup is a very gentle laxative, and as such is given to infants in a dose of one or two tea-spoonfuls.



It remains to notice those few syrups which have not a place in the Edinburgh Pharmacopœia.

SYRUPUS SUCCI FRUCTÛS MORI. Syrup of Mulberry Juice.

SYRUPUS SUCCI FRUCTÛS RUBI IDÆI. Syrup of Raspberry Juice.

SYRUPUS SUCCI FRUCTÛS RIBIS NIGRI. Syrup of Black-Currant Juice.

The syrups prepared from these fruits, inserted in the London Pharmacopœia, are pleasant and acidulous. Some of them, however, are superfluous.

SYRUPUS CROCI. Syrup of Saffron. *Pharm. Lond.* is admitted on account of its colour, as is also the SYRUPUS PAPAVERIS ERRATICI. Syrup of Red Poppy.

MEDICATED HONEYS differ in little or nothing from syrups, and are therefore rejected from the Edinburgh Pharmacopœia. In the London and Dublin Pharmacopœias, are retained, MEL ACETATUM. OXYMEL COLCHICI. MEL ROSÆ. MEL SCILLÆ. OXYMEL SCILLÆ; which, as the corresponding syrups have been noticed, it would be superfluous to give at length.

CHAPTER X.

VINA.—WINES.

WINE, from its composition, and especially from the alcohol and water it contains, is capable of dissolving the active matter of many vegetables. Solutions of this kind are named *Medicated Wines*. They are more liable to decomposition from keeping than tinctures. To obviate this, it is usual to add to them, when prepared, a portion of alcohol.

VINUM ALOES SOCOTORINÆ, *vulgo Tinctura Sacra.*
Wine of Socotorine Aloes. *Sacred Tincture.* [Vinum Aloes.]

“Take of Socotorine Aloes, reduced to powder, one ounce; Lesser Cardamom Seeds, Ginger Root, of each, beat, one drachm; Spanish White-wine, two pounds. Digest for seven days, shaking frequently, and strain.”

The aloes is entirely soluble in the wine; so that in this preparation all its virtues are obtained. It is a stimulating cathartic, producing its full effect in the dose of one ounce. In a dose of one or two drachms, it is given to excite the action of the intestines and neighbouring organs.

VINUM GENTIANÆ COMPOSITUM, *vulgo Vinum Amarum.*
Compound Gentian Wine.

“Take of Gentian Root, half an ounce; Peruvian Bark, one ounce; Orange Peel dried, two drachms; Canella Bark, one drachm; Diluted Alcohol, four ounces; Spanish White-wine, two pounds and a half. On the root and barks bruised, pour first the diluted alcohol; and after twenty-four hours, add the wine. Then macerate for seven days, and strain.”

This wine is designed as a stomachic; but from its tendency to become acescent, it is not well adapted to administration in dyspepsia. Its dose is six drachms.

VINUM IPECACUANHÆ. Ipecacuan Wine. [Vinum Ipecac.]

“Take of Ipecacuan Root bruised, one ounce; Spanish White-wine, fifteen ounces. Macerate for seven days, and strain through paper.”

This Medicated Wine is preferable to a Tincture of Ipecacuan, as being less pungent, while it holds the active matter of the root fully dissolved. Its dose as an emetic is one ounce to an adult.

VINUM NICOTIANÆ TABACI. Tobacco Wine.

“Take of the leaves of Tobacco, one ounce; Spanish White-wine, one pound. Macerate for seven days, and strain through paper.”

Under this form, Tobacco has been used as a diuretic in dropsy. Dose, thirty drops, gradually increased to sixty or eighty twice a-day.

VINUM RHEI PALMATI. Rhubarb Wine. [Vinum Rhabarbari.]

“Take of the Root of Rhubarb, cut, two ounces; Cinnamon Bark, one drachm; Diluted Alcohol, two ounces; Spanish White-wine, fifteen ounces. Macerate seven days, and strain through paper.”

The dose of this wine as a purgative is from half an ounce to an ounce. The tincture of rhubarb is in general to be preferred to it.



CHAPTER XI.

ACETA.—VINEGARS.

VINEGAR is capable of dissolving several of the principles of vegetables. It frequently, however, alters their powers, or does not coincide with them in virtue. There are, therefore, few Medicated Vinegars in use.

ACETUM AROMATICUM. Aromatic Vinegar.

“Take of the dried tops of Rosemary; the dried leaves of Sage, of each four ounces; dried Lavender Flowers, two ounces; Cloves, two drachms; distilled Acetous Acid, eight pounds. Macerate for seven days, and strain the expressed liquor through paper.”

From the impregnation of the vinegar with the flavour of these aromatic vegetables, it becomes a grateful perfume, to which purpose chiefly this preparation is applied.

ACIDUM ACETOSUM CAMPHORATUM. Camphorated Acetous Acid.

“Take of the stronger Acetous Acid, six ounces; Camphor, half an ounce; Alcohol, as much as may be necessary. Rub the Camphor with the Alcohol into a powder, which put into the acid, that it may be dissolved.

This preparation, snuffed up the nostrils, is a powerful and grateful stimulant, used to obviate nausea, or relieve languor.

ACETUM SCILLÆ MARITIMÆ. Vinegar of Squill. [Acet. Scillæ.]

“Take of Squill Root dried, two ounces; distilled Acetous Acid, two pounds and a half; Alcohol, three ounces. Macerate the squill with the acetous acid for seven days: express the acid; to which add the alcohol; and when the impurities have subsided, pour off the liquor.”

Vinegar is the proper menstruum of squill; and this preparation possesses all its powers, unimpaired. It is seldom given under this form as a diuretic, but generally as an expectorant. The dose is from one to two drachms.

CHAPTER XII.

TINCTURA.—TINCTURES.

TINCTURES are solutions of vegetable, animal, and sometimes of mineral substances, in spiritous liquors. The solvent may be either pure alkohol, diluted alkohol, or alkohol impregnated with ammonia or ether. They generally contain the virtues of the substances dissolved, in a concentrated state, though sometimes altered, or lost in those of the menstruum. They are little liable to decomposition, and this gives them a superiority over those preparations in which the solvent power of water is employed.

Alkohol is the solvent of a number of the immediate principles of vegetables; of resin, camphor, essential oil, and extract; and hence is capable of extracting the virtues of many important remedies. Tinctures made with it are in general decomposed on the addition of watery liquors.

Diluted Alkohol or Proof-spirit is a still more general solvent; as the water it contains dissolves several principles which are not soluble in pure alkohol. It is therefore more generally employed.

Alkohol, impregnated with ammonia or ether, is employed in forming tinctures only of a few substances, whose operations are supposed to be promoted by these agents.

TINCTURA ALOES SOCOTORINÆ. Tincture of Aloes.
[Tinct. Aloes.]

“ Take of Socotorine Aloes in powder, half an ounce; Extract of Liquorice, one ounce and a half; Alkohol, four ounces; Water, one pound. Digest for seven days with a gentle heat in a closed vessel, shaking the vessel frequently; (directions which, with regard to all tinctures, are to be observed.)”

This is the only tincture in which the proportion of water is superior to that of alkohol. The aloes being principally gum, is entirely dissolved by the menstruum. Its dose as a cathartic is one ounce.

TINCTURA ALOES ÆTHEREA. Ethereal Tincture of Aloes.

“Take of Myrrh, Socotorine Aloes, of each one ounce and a half; English Saffron, one ounce; Spirit of Sulphuric Ether, one pound. Digest the myrrh with the spirit for four days in a closed phial; then add the saffron and aloes. Digest again for four days; and when the impurities have subsided, pour off the tincture.”

By first digesting the myrrh with the spirit, a sufficient quantity of it is dissolved, which it would not be were the aloes added along with it; and by the second digestion, a sufficient quantity of the latter is taken up. The formula is the improvement of one which has long kept its place in the different pharmacopœias. It is a stimulating purgative in a dose of one or two drachms.

TINCTURA ALOES CUM MYRRHA. Tincture of Aloes and Myrrh. [Tinct. Aloes Comp.]

“Take of Myrrh powdered, two ounces; Alkohol, one pound and a half; Water, half a pound. Mix the alkohol with the water; then add the myrrh; digest for four days; and lastly, add of Socotorine Aloes, one ounce and a half; English Saffron, one ounce. Digest again for three days, and pour off the pure tincture.”

This tincture differs in little from the former but in the menstruum. It is used principally externally as an application to bleeding wounds, and a stimulant to foul ulcers.

TINCTURA AMOMI REPENTIS. Tincture of Cardamom.
[Tinctura Cardamomi.]

“Take of Cardamom Seeds, four ounces; Diluted Alcohol, two pounds and a half. Digest for two days, and strain through paper.”

This tincture is used for its moderate aromatic flavour and pungency. A compound tincture of cardamom, in which caraway, cinnamon and raisins, are introduced, is likewise inserted in the London Pharmacopœia, and is used for the same purpose.

TINCTURA ARISTOLOCHIÆ SERPENTARIÆ. Tincture of Snake-Root. [Tinctura Serpentar.]

“Take of Virginian Snake-root, two ounces; Cochineal, one drachm; Diluted Alcohol, two pounds and a half. Digest for seven days, and strain through paper.”

Serpentaria is seldom exhibited under the form of tincture. As a grateful bitter, it may be given occasionally in dyspepsia in a dose of two drachms.

TINCTURA ASSAFOETIDÆ. Tincture of Assafœtida.
[Tinctura Assafœtid.]

“Take of Assafœtida, four ounces; Alcohol, two pounds and a half. Digest for seven days, and strain through paper.”

This is a solution chiefly of the resinous part of the assafœtida. As a remedy in hysteria, it is sometimes given in a dose of one drachm.

TINCTURA BENZOES COMPOSITA, *vulgo Balsamum Traumaticum*. Compound Tincture of Benzoin.
[Tinctura Benzoes Comp.]

“Take of Benzoin, three ounces; Balsam of Peru, two ounces; Hepatic Aloes, half an ounce; Alcohol, two pounds. Digest for seven days, and strain through paper.”

This is used only externally, and principally as an application to recent superficial wounds.

TINCTURA CAMPHORÆ; *vulgo Spiritus Vinosus Camphoratus*. Tincture of Camphor. [Spiritus Camphorat.]

“Take of Camphor, one ounce; Alkohol, one pound. Mix, so as to dissolve the camphor. It may be also made with a double or triple proportion of camphor.”

This solution is used externally as a stimulant and anodyne application in chronic rheumatism, bruises and strains. It is applied by friction to the part.

LINIMENTUM CAMPHORÆ COMPOSITUM. *Lond.*

“Take of camphor two ounces; Water of Ammonia, six ounces; Spirit of Lavender, sixteen ounces. Mix the water of ammonia with the spirit, and distil sixteen ounces from a glass retort with a gentle heat. Dissolve the camphor in the distilled liquor.”

This liniment is applied to the same uses as the preceding. From the addition of the ammonia it is more powerful as a stimulant.

TINCTURA CASSIÆ SENNÆ COMPOSITA, *olim Elixir Salutis*. Tincture of Senna. [Tinct. Sennæ.]

“Take of the Leaves of Senna, two ounces; Root of Jalap, one ounce; Coriander Seeds, half an ounce; Diluted Alkohol, three pounds and half. Digest for seven days, and to the tincture strained through paper add four ounces of Refined Sugar.”

This tincture is in very common use as a purgative. Its dose is one ounce, or one ounce and a half.

TINCTURA CASTOREI. Tincture of Castor. [Tinct. Castor.]

“Take of Russian Castor, one ounce and a half; Alcohol, one pound. Digest for seven days, and strain through paper.”

In the London, and likewise in the Dublin Pharmacopœia, this tincture is ordered to be prepared with diluted alcohol; but with pure alcohol it is more grateful. It is a feeble remedy, given sometimes as an antispasmodic, in a dose of from half a drachm to a drachm.

TINCTURA CASTOREI COMPOSITA. Compound Tincture of Castor.

“Take of Russian Castor, one ounce; Assafœtida, half an ounce; Ammoniated Alcohol, one pound. Digest for seven days, and strain through paper.”

This tincture is more active than the former; it is given in a similar dose.

TINCTURA CINCHONÆ OFFICINALIS. Tincture of Peruvian Bark. [Tinct. Cinchonæ.]

“Take of Peruvian Bark in powder, four ounces; Diluted Alcohol, two pounds and a half. Digest for seven days, and strain through paper.”

The active matter of bark is entirely extracted by diluted alcohol, but the powers of the menstruum itself do not allow of the use of bark under this form, where large doses of the remedy are necessary. It is used in dyspepsia, occasionally, in a dose of two drachms.

TINCTURA CINCHONÆ, *vulgo Corticis Peruviani*, Composita. Compound Tincture of Peruvian Bark. *Lond.*

“Take of Peruvian Bark in powder, two ounces; dried Orange-peel, one ounce and a half; Virginian
2 K

Snake-root, three drachms; Saffron, one drachm; Chochineal in powder, two scruples; Proof-Spirit, twenty ounces. Digest for fourteen days, and strain."

This has been long known under the name of *Huxham's tincture of Bark*. It is more grateful than the simple tincture, and is used like it in dyspeptic affections, in a dose of two or three drachms.

TINCTURA CINCHONÆ, *vulgo Corticis Peruviani*, Ammoniatæ. *Lond.* Ammoniated Tincture of Bark.

"Take of Peruvian Bark in powder, four ounces; Compound Spirit of Ammonia, two pounds. Digest in a closed vessel for ten days, and strain."

There seems little propriety in employing spirit of ammonia as a menstruum of bark, as in scarcely any case can they coincide in virtue, and the activity of the ammonia must be much superior to that of the quantity of bark dissolved.

TINCTURA COLOMBÆ. Tincture of Colombo. [Tinct. Colomb.]

"Take of the Root of Colombo in powder, two ounces; Diluted Alcohol, two pounds. Digest for seven days, and strain through paper."

This is used merely as a bitter tincture in dyspepsia, in a dose of three or four drachms.

TINCTURA CONVULVULI JALAPÆ. Tincture of Jalap. [Tinct. Jalap.]

"Take of the root of Jalap in powder, three ounces; Diluted Alcohol, fifteen ounces. Digest for seven days, and strain through paper."

The activity of jalap resides in its resin, which in this preparation is extracted along with a portion of mucilage. The tincture may be given as a cathartic, in a dose of four or six drachms.

TINCTURA CROCI. Tincture of Saffron.

“Take of English Saffron, one ounce; Diluted Alcohol, fifteen ounces. Digest for seven days, and strain through paper.”

This tincture is to be valued only for its colour.

TINCTURA DIGITALIS PURPUREÆ. Tincture of Foxglove.

“Take of the dried leaves of Foxglove, one ounce; Diluted Alcohol, eight ounces. Digest for seven days, and strain through paper.”

This is a very active preparation; it is the one in which the virtues of digitalis are longest preserved uninjured, and appears to be the best form under which that remedy can be exhibited, to obtain its *narcotic* effects. Its dose is ten drops, which, according to the general rules observed in the administration of digitalis, is to be gradually increased.

TINCTURA GENTIANÆ COMPOSITA, *vulgo Elixir Stomachicum*. Compound Tincture of Gentian. [Tinct. Gentian. Comp.]

“Take of Gentian Root, two ounces; dried Orange-peel, one ounce; Canella Bark, half an ounce; Cochineal, half a drachm; Diluted Alcohol, two pounds and a half. Digest for seven days, and strain through paper.”

This tincture is employed in dyspepsia, in a dose of two or three drachms given occasionally.

TINCTURA GUAJACI. Tincture of Guaiac.

“Take of the Resin of Guaiac, one pound; Alcohol, two pounds and a half. Digest for seven days, and strain through paper.”

This tincture may be given in a dose of two or three drachms, but it is inferior in activity to the one which follows.

TINCTURA GUAIACI AMMONIATA. Ammoniated Tincture of Guaiac. [Tinct. Guaiac. Ammon.]

“ Take of the Resin of Guaiac, four ounces; Ammoniated Alcohol, one pound and a half. Digest for seven days, and strain through paper.”

The ammonia coinciding in virtue with the guaiac, this affords a preparation of considerable efficacy. It is given in chronic rheumatism, in a dose from one to two drachms.

TINCTURA HELLEBORI NIGRI. Tincture of Black Hellebore. [Tinct. Helleb. Nig.]

“ Take of Black Hellebore Root, four ounces; Cochineal, half a drachm; Diluted Alcohol, two pounds and a half. Digest for seven days, and strain through paper.”

This tincture has been used as an emmenagogue, in a dose of one drachm.

TINCTURA HYOSCIAMI NIGRI. Tincture of Black Henbane.

“ Take of the dried Leaves of Black Henbane, one ounce; Diluted Alcohol, eight ounces. Digest for seven days, and strain through paper.”

The tincture is a preferable form to the inspissated juice, the form under which black henbane used to be employed.

TINCTURA KINO. Tincture of Kino.

“ Take of Kino, two ounces; Diluted Alcohol, one pound and a half.”

The dose of this tincture, is from half a drachm to a drachm.

TINCTURA LAURI CINNAMOMI. Tincture of Cinnamon. [Tinct. Cinnam.]

“ Take of Cinnamon Bark, three ounces; Diluted Alkohol, two pounds and a half. Digest for seven days, and strain through paper.”

• This is used merely as an aromatic.

TINCTURA LAURI CINNAMOMI COMPOSITA, *olim Tinctura Aromatica*. Compound Tincture of Cinnamon. [Tinct. Cinnam. Comp.]

“ Take of the Bark of Cinnamon, Cardamom-seeds, of each one ounce; Long Pepper, two drachms; Diluted Alkohol, two pounds and a half. Digest for seven days, and strain through paper.”

This tincture is used principally in combination with other medicines, to communicate to them an aromatic pungency and odour.

TINCTURA MELOES VESICATORII, *vulgo Tinctura Cantharidum*. Tincture of Cantharides. [Tinct. Canthar.]

“ Take of Cantharides, one drachm; Diluted Alkohol, one pound. Digest for seven days, and strain through paper.”

This tincture is used principally externally as a rubefacient; as an internal remedy, the dose in which it has been given is fifteen drops.

TINCTURA MIMOSÆ CATECHU; *olim, Tinctura Japonica*. Tincture of Catechu. [Tinct. Catechu.]

“ Take of Catechu, three ounces; Bark of Cinnamon, two ounces; Diluted Alkohol, two pounds and a half. Digest for seven days, and strain through paper.”

This solution of catechu, rendered more grateful by the cinnamon, is given in a dose of one drachm.

TINCTURA MYRRHÆ. Tincture of Myrrh. [Tinct. Myrrh.]

“ Take of Myrrh in powder, three ounces; Alkohol, twenty ounces; Water, ten ounces. Digest for ten days, and strain through paper.”

Myrrh being principally resinous, requires for its solution alkohol, not so much diluted as proof-spirit. The tincture is used principally as an external stimulant and antiseptic application.

TINCTURA OPII, *sive Thebaica; vūlgo, Laudanum liquidum.* Tincture of Opium. [Tinct. Opii.]

“ Take of Opium, two ounces; Diluted Alkohol, two pounds. Digest for seven days, and strain through paper.”

This tincture is the usual form under which opium is administered. The proportion of opium to the solvent, is five grains to the drachm; but by evaporation it is found that one drachm of the tincture holds three grains and a half dissolved. The usual dose is twenty-five drops.

TINCTURA OPII AMMONIATA; *olim, Elixir Paregoricum.* Ammoniated Tincture of Opium.

“ Take of Benzoic Acid, English Saffron, of each three drachms; Opium, two drachms; Volatile Oil of Anise, half a drachm; Ammoniated Alkohol, sixteen ounces. Digest for seven days in a shut phial, and strain through paper.”

The operation of the opium cannot be much influenced by the substances with which it is combined in this formula. The common application of it is as a remedy in catarrhal affections. Its dose is from half a drachm to a drachm. The proportion of opium is one grain to a drachm.

TINCTURA OPII CAMPHORATA. *Lond.*

“Take of Hard Purified Opium reduced to powder, Flowers of Benzoin, of each one drachm; Camphor, two scruples; Oil of Anise, one drachm; Proof-Spirit, two pounds by measure. Digest for ten days, and strain.”

This tincture, known like the preceding one by the name of Paregoric Elixir, differs from it not only in some of the ingredients and in the menstruum, but in the proportion of opium. Half an ounce of it contains only one grain. Its dose is two or three drachms.

TINCTURA RHEI PALMATI. Tincture of Rhubarb.
[Tinct. Rhabarb.]

“Take of the Root of Rhubarb, three ounces; Lesser Cardamom Seeds, half an ounce; Diluted Alcohol, two pounds and a half. Digest for seven days, and strain through paper.”

This tincture contains all the virtues of rhubarb. Its dose is from half an ounce to an ounce.

TINCTURA RHEI CUM ALOE; *olim, Elixir Sacrum.*
Tincture of Rhubarb with Aloes.

“Take of the Root of Rhubarb, ten drachms; Socotrine Aloes, six drachms; Lesser Cardamom Seeds, half an ounce; Diluted Alcohol, two pounds and a half. Digest for seven days, and strain through paper.”

This is frequently employed as a stimulating cathartic, in a dose of six drachms, or an ounce.

TINCTURA RHEI CUM GENTIANA; *olim, Tinctura Rhei Amara.* Tincture of Rhubarb with Gentian.

“Take of Root of Rhubarb, two ounces; Gentian Root, half an ounce; Diluted Alcohol, two pounds and a half. Digest for seven days, and strain through paper.”

This combination of gentian with rhubarb is supposed to render it a more useful remedy in dyspeptic cases. Its dose is from two to four drachms.

TINCTURA RHEI COMPOSITA. *Lond.* Compound Tincture of Rhubarb.

“Take of Rhubarb cut, two ounces; Liquorice bruised, half an ounce; Ginger in powder, Saffron, of each two drachms; Distilled Water, one pound; Proof-Spirit, twelve ounces. Digest for fourteen days, and strain.”

This tincture differs in little from the simple tincture, except in the use of a menstruum, containing less alcohol. It may be given in a similar dose.

TINCTURA SAPONIS, *vulgo Linimentum Saponaceum.*
Tincture of Soap. [Liniment. Sapon. Comp.]

“Take of Soap, four ounces; Camphor, two ounces; Volatile Oil of Rosemary, half an ounce; Alcohol, two pounds. Digest the soap in the alcohol for three days; then add the camphor and oil to the strained liquor, agitating it.”

This is a powerful stimulant used as an external application in strains and rheumatic pains.

TINCTURA SAPONIS CUM OPIO; *olim, Linimentum Anodynum.* Tincture of Soap with Opium.

“This is made in the same manner, and from the same ingredients, as the tincture of soap; only adding at first one ounce of opium.”

It is used for the same purposes as the preceding tincture, but is a more powerful anodyne.

TINCTURA TOLUIFERÆ BALSAMI; *olim, Tinctura Tolutana.* Tincture of Tolu Balsam. [Tinct. Balsam. Tolut.]

“Take of Balsam of Tolu, one ounce and a half; Alcohol, one pound. Digest until the balsam is dissolved, and strain through paper.”

This tincture is scarcely used but on account of its flavour, and for making the Syrup of Tolu.

TINCTURA VERATRI ALBI. Tincture of White Hellebore.

“Take of White Hellebore Root, eight ounces; Diluted Alcohol, two pounds and a half. Digest for seven days, and strain through paper.”

White Hellebore is a medicine perhaps never prescribed internally, its operation is so violent. The dose of this tincture cannot exceed a few drops.

The following are the Tinctures peculiar to the London Pharmacopœia. In each of them the pound is by measure, or is equivalent to a pint.

TINCTURA AURANTII CORTICIS. Tincture of Orange-peel.

“Take of Fresh Orange-peel, three ounces; Proof-Spirit, two pounds. Digest for three days, and strain.” It may be used as stomachic and as a grateful bitter.

TINCTURA BALSAMÆ PERUVIANI. Tincture of Peruvian Balsam.

“Take of Peruvian Balsam, four ounces; Rectified Spirit of Wine, one pound. Digest until the balsam is dissolved.”

This tincture is scarcely applied to any use.

TINCTURA CASCARILLÆ. Tincture of Cascarilla.

“Take of Cascarilla in powder, four ounces; Proof-Spirit, two pounds. Digest with a gentle heat for eight days, and strain.”

Cascarilla being a remedy little employed in modern practice, this tincture is scarcely used.

TINCTURA GALBANI. Tincture of Galbanum.

“Take of Galbanum cut into small pieces, two ounces; Proof Spirit, two pounds. Digest with a gentle heat for eight days, and strain.”

Tincture of Galbanum has been used in hysteria, flatulence and asthma, in a dose from one to three drachms.

TINCTURA SABINÆ COMPOSITA. Compound Tincture of Savin.

“Take of Extract of Savin, one ounce; Tincture of Castor, one pound; Tincture of Myrrh, half a pound. Digest until the extract of savin is dissolved, and strain.”

This tincture has been recommended as an emmenagogue, in a dose of half a drachm twice a-day.

TINCTURA SCILLÆ. Tincture of Squill.

“Take of Squill recently dried, four ounces; Proof-Spirit, two pounds. Digest for eight days, and pour off the liquor.”

As vinegar best covers the nauseous taste of squill, it is generally used as its menstruum. This tincture contains, however, the active matter of this root, and may be given in a dose of from twenty to sixty drops.

TINCTURA VALERIANÆ. Tincture of Valerian.

“Take of Wild Valerian in coarse powder, four ounces; Proof-Spirit, two pounds. Digest with a gentle heat for eight days, and strain.”

TINCTURA VALERIANÆ AMMONIATA. Ammoniated
Tincture of Valerian.

“Take of Wild Valerian in coarse powder, four ounces; Compound Spirit of Ammonia, two pounds. Digest for eight days, and strain.”

Of these two tinctures, the latter is the more powerful, and is a remedy not unfrequently employed in hysteric affections. Its dose is from one to two drachms.

TINCTURA ZINGIBERIS. Tincture of Ginger.

“Take of Ginger in powder, two ounces; Proof-Spirit, two pounds. Digest with a gentle heat for eight days, and strain.”

This tincture contains the pungency of the ginger, and may be used as an aromatic in combination with other remedies.

CHAPTER XIII.

EXTRACTA.—EXTRACTS.

WHEN vegetable matter is dissolved in water or alcohol, by evaporation of the solvent, a concrete tenacious mass is obtained, termed an Extract. When prepared from an aqueous solution, it is named a Watery, when from one in alcohol pure or diluted, a Spiritous extract. The former must consist chiefly of those proximate principles which water can easily dissolve; mucilage, tannin, extractive and saline matter: the latter of a portion of these with resin. In either preparation, the volatile principles must necessarily be dissipated; and in many cases, especially in the preparation of the watery extracts, decomposition or oxygenation of the more fixed parts take place. Hence there are few vegetables whose virtues are obtained uninjured in their extracts.

I.—EXTRACTA PER AQUAM. EXTRACTS BY WATER.

The directions for preparing these are given in the Edinburgh Pharmacopœia, under the Extract of Gentian.

EXTRACTUM GENTIANÆ LUTÆ. Extract of Gentian.
[Extract. Gentian.]

“Take of Gentian Root, any quantity. Having cut and bruised it, add eight times its weight of distilled Water. Boil to one half, and strain, expressing the liquor strongly. Reduce it immediately to the consistence of thick honey, by evaporation in a bath of boiling water, saturated with muriat of soda.”

This extract is intensely bitter. It is generally used to form other medicines into pills.

In the same manner are prepared the following Extracts:

EXTRACTUM RADICIS GLYCYRRHIZÆ GLABRÆ. Extract of Liquorice Root. [Extract. Glycyrr.]

It consists chiefly of mucilage and saccharine matter, and is used as a demulcent in catarrh. It is seldom prepared in the shops, but on a large scale; and in some of the foreign Pharmacopœias, the extract of liquorice of commerce is ordered to be purified by solution in water, straining, and a new evaporation. This is named Refined Liquorice.

EXTRACTUM RADICIS HELLEBORI NIGRI. Extract of Black Hellebore Root. [Extract. Helleb. Nig.]

The spiritous extract of this root is extremely violent in its operation. The aqueous which is received in the Edinburgh Pharmacopœia is comparatively mild. Its dose is from ten to twenty grains.

EXTRACTUM FOLIORUM RUTÆ GRAVEOLENTIS. Extract of Rue. [Extract. Rutæ.]

As the virtues of Rue reside chiefly, if not entirely, in its essential oil, this extract received in both Pharmacopœias must be regarded as an injudicious preparation.

EXTRACTUM FOLIORUM CASSIÆ SENNÆ. Extract of Senna. [Extract. Sennæ.]

Senna has its activity much impaired by decoction. The extract, therefore, cannot be regarded as a proper preparation of it.

EXTRACTUM FLORUM ANTHEMIDIS NOBILIS. Extract of Chamomile. [Extract. Chamæmeli.]

The unpleasant flavour of chamomile is entirely dissipated by decoction. The extract is, therefore, a pure and grateful bitter.

EXTRACTUM CAPITUM PAPAVERIS SOMNIFERI. Extract of Poppy. [Extract. Papaveris Albi.]

This extract from the capsule of the poppy retains its narcotic quality, but is not uniform in strength. Sometimes it is used in making the Syrup of Poppy.

EXTRACTUM LIGNI HÆMATOXYLI CAMPECHENSIS. Extract of Logwood. [Extract. Hæmatoxyli.]

The astringency of the logwood is obtained entire in this extract. It is sometimes used as the basis of astringent mixtures. Its dose is from ten to twenty grains.

THE watery extracts in the London Pharmacopœia are the same with those in the Edinburgh, with the addition of Extract of Broom, of Savin, of Peruvian Bark.

EXTRACTUM CACUMINIS GENISTÆ. Extract of Broom
Tops.

An infusion of broom tops has been used as a diuretic; but the extract can scarcely be considered as possessing any power.

EXTRACTUM SABINÆ. Extract of Savin.

This is liable to the same objection as the extract of rue,—that its virtues reside chiefly in its essential oil, which must be dissipated during the process.

EXTRACTUM CINCHONÆ, *vulgo Corticis Peruviani*. Ex-
tract of Peruvian Bark.

“ Take of Peruvian Bark, in coarse powder, one pound; Distilled Water, twelve pounds. Boil for an hour or two, and pour off the liquor, which, while hot, will be red and pellucid; but as it cools, becomes yellow and turbid. Pour on again the same quantity of water; boil as formerly; and repeat the boiling, until the liquor, when cold, remains limpid. Then reduce all these liquors, mixed together and strained, to a proper consistence, by evaporation.

“ This extract ought to be prepared under two forms; one *soft*, fit to form pills; the other *hard*, so that it may be reduced to powder.”

The active matter of bark is in a great measure of a resinous nature, but this the water, when assisted by a boiling heat, is capable of dissolving. During the boiling and evaporation, however, it suffers a chemical change to a certain extent; and the extract obtained is far from being equal in efficacy to the quantity of bark from which it is prepared. Its medium dose is ten grains, and is supposed to be equivalent to half a drachm of the bark in substance. In the above process the boiling is continued too long, and the direction to strain the liquors is improper.

II.—EXTRACTA PER AQUAM ET ALKOHOL. EXTRACTS BY WATER AND ALKOHOL.

EXTRACTUM CINCHONÆ OFFICINALIS. Extract of Peruvian Bark. [Extract Cinchonæ vulgo Cortic. Peruv. cum Resina.]

“ Take of Peruvian Bark in powder one pound; Alkohol, four pounds. Digest for four days, and pour off the tincture. Boil the residuum in five pounds of distilled water for a quarter of an hour, and strain the decoction while hot through linen. Repeat this boiling and straining with an equal quantity of distilled water, and reduce the liquor by evaporation to the consistence of thin honey. Draw off the alkohol from the tincture by distillation, until it is reduced to a similar consistence. Then mix the liquors thus inspissated, and reduce to a proper consistence by a bath of boiling water, saturated with muriat of soda.”

This preparation is undoubtedly preferable to the watery extract of bark. By the joint action of the alkohol and water, every principle adhering to the mere ligneous fibre of the bark is dissolved. And in the subsequent evaporation, the dissolved matter suffers less injury, partly from less heat being required to bring it to the due consistence, and partly perhaps from the alkohol resisting the oxygenation of the extract. It is, however, much more expensive; and the extract of bark to be found in the shops is generally that prepared by the preceding formula. The dose of this extract is ten grains.

EXTRACTUM RADICIS CONVULVULI JALAPÆ. Extract of Jalap. [Extract. Jalapii.]

This is ordered to be prepared in the same manner as the Extract of Bark. It is a cathartic capable of operating fully in a dose of ten or twelve grains.

BESIDES these two, there are some other Spiritous Extracts in the London Pharmacopœia.

EXTRACTUM CASCARILLÆ. Extract of Cascarilla.

It may be regarded as bitter and tonic. Its dose is one scruple or half a drachm.

EXTRACTUM COLOCYNTHIDIS COMPOSITUM. Compound Extract of Colocynth.

“Take of the Pith of Colocynth cut small, six drachms; Socotorine Aloes in powder, one ounce and a half; Scammony in powder, half an ounce; Lesser Cardamom Seeds freed from the husks, powdered, one drachm; Proof Spirit, one pound. Digest the colocynth in the spirit with a gentle heat for four days. To the expressed tincture add the aloes and scammony. These being dissolved, draw off the spirit by distillation; then evaporate the water, adding the seeds towards the end of the evaporation. Make an extract fit for forming pills.”

This composition, formerly known by the name of Cathartic Extract, is a cathartic of much power, sometimes employed in obstinate constipation. Its dose is from five to twenty grains.

OPIUM PURIFICATUM. Purified Opium.

“Take of Opium cut into small pieces, one pound; Proof-Spirit, twelve pounds. Digest with a gentle heat, agitating frequently until the opium is dissolved; strain the tincture through paper, and distil it thus prepared to a proper consistence. Purified opium ought to be kept under two forms; soft, so as to be fit to form pills; and hard, so as to be capable of being reduced to powder.”

A process similar to this had a place in the Edinburgh Pharmacopœia, but has properly been expunged. It has been clearly proved, that during this process the opium

suffers decomposition, probably from the action of the oxygen of the air, and that the solid purified mass is not equal in narcotic power to the opium from which it has been prepared. It is a process, too, entirely unnecessary, as the impurities of the opium are not considerable; they neither alter its virtues, nor add much to its bulk.

CHAPTER XIV.

AQUÆ STILLATILÆ.—DISTILLED WATERS.

By distillation of water from vegetable substances, it is frequently impregnated with their flavour and taste. This is owing to their essential oil being volatilized at the temperature at which water boils, and being dissolved in small proportion by the water condensed. It is very seldom that any important virtue of vegetables resides in that principle, and hence the different distilled waters are more used as vehicles of other remedies, than as being themselves active medicines. It is evident that it is only those vegetables which contain a sensible quantity of essential oil, that can be subjected with advantage to this process, and that any quality residing in the other principles of the vegetable will not be obtained in the distilled water. To preserve the distilled waters from decomposition, to which they are liable, from the small quantity of vegetable matter they contain, a proportion of alcohol, about one fiftieth of their weight, may be added to them; and they require to be kept secluded from the air.

AQUA DESTILLATA. Distilled Water. [Aq. Distillata.]

“Distil Water in clean vessels until about two-thirds have come over.”

In nature no water is found perfectly pure. Spring or river water always contains a portion of saline matter, principally sulphat of lime; and, from this impregnation,

is unfit for a number of pharmaceutic preparations. By distillation a perfectly pure water is obtained.

AQUA CORTICIS CITRI AURANTII. Water of Orange-Peel.

“Take of Fresh Orange Peel two pounds. Pour on these as much water, that when ten pounds shall have been drawn off by distillation, a quantity shall remain sufficient to prevent empyreuma. After due maceration distil ten pounds.”

This distilled water has merely the odour of the orange-peel.

In the same manner are prepared the following; which require no particular observations, since they possess merely the odour, and some of them the taste and pungency of the vegetables from which they are prepared. Ten pounds of water are to be drawn by distillation from the quantities annexed to each:

Aqua Corticis Fructûs Citri Medicæ Recentis. (Fresh lemon peel, two pounds.)

Aqua Corticis Lauri Cassiæ. (Bark of Cassia, one pound.)

Aqua Corticis Lauri Cinnamomi. (Bark of Cinnamon, one pound.) [Aq. Cinnamomi.]

Aqua Menthæ Piperitæ Florentis. (Fresh peppermint, three pounds.) [Aq. Menth. Pip.]

Aqua Menthæ Pulegii Florentis. (Fresh pennyroyal, three pounds.) [Aq. Pulegii.]

Aqua Fructûs Myrti Pimentæ. (Pimento, half a pound.) [Aq. Pimento.]

Aqua Petalorum Rosæ Centifoliæ Recentium. (Fresh petals of the rose, six pounds.) [Aq. Rosæ.]

In the London Pharmacopœia are likewise inserted,

Aqua Anethi, Dill-Seed Water.

Aqua Foeniculi, Fennel-Seed Water.

Aqua Menthæ Sativæ, Spearmint-Water.

CHAPTER XV.

SPIRITUS STILLATITII.—DISTILLED SPIRITS.

THESE are prepared by distilling pure alkohol or diluted alkohol from vegetable substances. Alkohol in its pure state, seldom receives any sensible impregnation; because, although it is capable of dissolving the essential oils of plants, there are very few of them which it can bring over in distillation; a higher temperature being necessary to volatilize them than the alkohol. But, by employing diluted alkohol, a liquor is obtained more odorous and pungent. When heated with the vegetable, the alkohol first distils over, and afterwards the water with the essential oil, and the whole, when condensed, forms a transparent fluid. These distilled spirits, like the distilled waters, are in general merely agreeable vehicles for the exhibition of other medicines, or grateful stimulants, sometimes used to relieve nausea or flatulence. The directions for preparing them are given, in the Pharmacopœia, under the Spirit of Caraway.

SPIRITUS CARI CARVI. Spirit of Caraway. [Spirit. Carui.]

“ Take of Caraway Seeds, half a pound. Pour on of Diluted Alkohol, nine pounds. Macerate during two days in a close vessel: then add a sufficient quantity of water to prevent empyreuma, and draw off nine pounds by distillation.”

In the same manner are prepared the following spirits. Nine Pounds being drawn from the quantities affixed to each:

Spiritus Corticis Lauri Cinnamomi. (Bark of Cinnamon, one pound.) [Spirit Cinnamom.]

Spiritus Menthæ Piperitæ Florentis. (Herb of peppermint, one pound and a half.) [Spirit. Menth. P.]

Spiritus Nucis Myristicæ Moschatæ. (Nutmeg, two ounces.) [Spirit. Myrist.]

Spiritus Fructûs Myrti Pimentæ. (Fruit of pimento, half a pound.) [Spirit. Pimento.]

To these may be added from the London Pharmacopœia,

Spiritus Menthæ Sativæ. Spirit of Spearmint.

Spiritus Pulegii. Spirit of Pennyroyal.

Of Compound Spirits, the following have a place in the Pharmacopœias:

SPIRITUS JUNIPERI COMMUNIS COMPOSITUS. Compound Spirit of Juniper. *Pharm. Ed.* [Spirit. Junip. Comp.]

“ Take of Juniper Berries bruised, one pound ; Caraway Seeds, Fennel Seeds, of each one ounce and a half ; Diluted Alcohol nine pounds. Macerate for two days ; and, adding as much Water as is sufficient to prevent empyreuma, draw off nine pounds by distillation.”

This has been used as a carminative and diuretic.

SPIRITUS ANISI COMPOSITUS. Compound Spirit of Anise. *Pharm. Lond.*

“ Take of Anise Seeds, Angelica Seeds, of each bruised half a pound ; Proof-Spirit, one gallon ; Water as much as is sufficient to prevent empyreuma. Distil one gallon.”

Used also as a carminative.

SPIRITUS RAPHANI COMPOSITUS. Spirit of Horse-radish. *Pharm. Lond.*

“ Take of fresh Horse-radish root, dried Orange-peel, of each two pounds ; fresh Garden Scurvy-grass four

pounds; Nutmegs bruised, one ounce; Proof-Spirit, two gallons; Water, as much as is sufficient to prevent empyreuma. Distil two gallons."

This was at one time recommended as an antiscorbutic. It has justly fallen into disuse.

There remain, lastly, those Distilled Spirits prepared with pure Alkohol.

SPIRITUS LAVANDULÆ SPICÆ. Spirit of Lavender.
[Spirit. Lavend.]

"Take of fresh Lavender Flowers, two pounds; Alkohol, eight pounds. Draw off seven pounds by distillation in a water bath."

This is scarcely applied to any purpose but that of a perfume.

SPIRITUS LAVANDULÆ SPICÆ COMPOSITUS. Compound Spirit of Lavender. [Spirit. Lavendulæ Composit.]

"Take of Spirit of Lavender, three pounds; Spirit of Rosemary, one pound; Cinnamon Bark, one ounce; Cloves, two drachms; Nutmeg, half an ounce; Red Saunders Wood, three drachms. Macerate seven days and strain."

This tincture is a grateful cordial in common use, as relieving languor and faintness. Its dose is thirty or forty drops.

SPIRITUS ROSISMARINI OFFICINALIS. Spirit of Rosemary. [Spirit. Rosmar.]

"Take of Fresh Rosemary Tops, two pounds; Alkohol, eight pounds. Draw off seven pounds by distillation in a water-bath."

This spirit is a very fragrant perfume.

ALCOHOL.

THERE is no process in the Edinburgh Pharmacopœia for the preparation of alkohol. The following is given by the London College :

“ Take of Rectified Spirit of Wine, one gallon ; Prepared Kali (Sub-carbonat of Potash) hot, one pound and a half ; Pure Kali (Potash), one ounce. Mix the vinous spirit with the pure kali, and then add one pound of the prepared kali, while hot. Agitate and digest for twenty-four hours. Pour off the spirit ; add to it the remainder of the prepared kali, and distil from a water-bath. Preserve the alkohol in a vessel well stopt. The prepared kali ought to be heated to 300°.

“ The specific gravity of alkohol is to that of distilled water as 815 to 1000.”

The Rectified Spirit of Wine, employed in this process, is prepared by distillation from the spiritous liquors of commerce. It consists of alkohol with a portion of water. The Potash, employed in the present process, abstracts the greater part of this water, by the strong attraction it exerts to it ; and, by a careful distillation, the alkohol is obtained, if not entirely, at least nearly pure.

The specific gravity required in the alkohol employed in the processes of the Edinburgh Pharmacopœia, is only 835 ; and, though at that standard, it must contain a portion of water, it is sufficiently strong for all pharmaceutical purposes.

CHAPTER XVI.

OLEA VOLATILIA, olim OLEA STILLATITIA vel ESSENTIALIA.
VOLATILE OILS, DISTILLED OR ESSENTIAL OILS.

THE chemical properties of essential oils have already been described. They differ somewhat in their sensible qualities, but all of them are highly odorous and pungent; and, as medicines, they possess a stimulating power. They are generally employed as corrigents, to improve the flavour and taste of the medicines with which they are mixed, to cause them to sit easier on the stomach, or obviate any unpleasant symptoms they may be apt to produce.

As these oils frequently exist in distinct vesicles in the vegetable, some of them may be obtained by expression; but, in general, they are procured by distillation. The rules given in the Edinburgh Pharmacopœia are the following: "These oils are to be prepared in the same manner as the Distilled Waters, except that a smaller quantity of water is to be added. Seeds and roots are to be previously bruised or rasped. The oil accompanies the water, and is afterwards separated from it, according as it is lighter or heavier, by swimming on the surface or falling to the bottom.

"It is also to be observed with regard to the preparation of these distilled waters and oils, that, from the goodness of the substances, their texture, the season of the year, and similar circumstances, so many differences must arise, that it is scarcely possible to give any certain and general rules which shall apply strictly to every example. Many things therefore are omitted, to be regulated according to the judgment of the operator, the most general precepts only being delivered."

The qualities of these oils are considerably varied by a number of circumstances, more especially by climate, soil, and season. They are likewise injured by too long keeping. Being high priced, they are also frequently

adulterated by dilution with alcohol, by the addition of an expressed oil, or by intermixture with each other; the cheaper being used to adulterate the more valuable. The first is detected by the milkiness produced and continuing for some time, on dropping the adulterated oil on water; the second, by the sophisticated oil leaving a permanent greasy spot on paper; and the third may, in general, be discovered by the smell of the coarser oil, rendering it more ardent if necessary, by the application of a gentle heat.

It is not necessary to notice particularly the different essential oils, as they possess merely the aromatic quality of the vegetables from which they are prepared. The following are those inserted in the Edinburgh Pharmacopœia:

Oleum Herbæ Menthæ Piperitæ Florentis. Oil of Peppermint. [Oleum Menth. Pip.]

Oleum Herbæ Juniperi Sabinæ. Oil of Savine.

Oleum Summitatum Florentium Rorismarini Officinalis.
Oil of Rosemary. [Ol. Rorismar.]

Oleum Spicarum Florentium Lavandulæ Spicæ. Oil of Lavender. [Ol. Lavend.]

Oleum Seminum Pimpinellæ Anisi. Oil of Anise. [Ol. Ess. Anisi.]

Oleum Baccarum Juniperi Communis. Oil of Juniper. [Ol. Junip. Bacc.]

Oleum Radicis Lauri Sassafras. Oil of Sassafras. [Ol. Rad. Sassafras.]

Oleum Fructûs Myrti Pimentæ. Oil of Pimento.

The London College have also ordered,

Oleum Essentiale Carui. Oil of Caraway.

Oleum Menthæ Sativæ. Oil of Spearmint.

Oleum Origani. Oil of Wild Thyme.

Oleum Pulegii. Oil of Pennyroyal.

OLEUM SUCCINI ET ACIDUM SUCCINI. Oil and Acid of Amber. [Sal et Oleum Succini.]

“ Take of Amber in powder, Pure Sand, equal parts. Put them mixed into a glass retort, of which they shall fill one-half. Having adapted a large receiver, distil from a sand-bath, with a fire gradually raised. First, a watery liquor with a little of a yellow oil, will distil; then a yellow oil with an acid salt; afterwards, a reddish and black oil. Pour the liquor out of the receiver, and let the oil be separated from the water. Let the acid salt, collected from the neck of the retort, and the sides of the receiver, be pressed between folds of bibulous paper, and freed from the adhering oil. Then purify it by solution in hot water and crystallization.”

Amber is a bitumen which suffers decomposition by heat. The acid which it affords is one *sui generis*; the oil approaches in its properties to the other empyreumatic oils. The acid is never used in medicine; the oil is sometimes employed externally as a stimulant, and internally as an antispasmodic, but is also falling into disuse. A process is ordered in the Pharmacopœia for its purification.

OLEUM SUCCINI PURISSIMUM. Purified Oil of Amber. [Ol. Succin. Rectif.]

“ Distil Oil of Amber mixed with six times its quantity of Water, from a glass retort, until two-thirds of the water have passed into the receiver. Then separate this purified volatile oil from the water, and keep it in vessels well stopt.”

The oil thus purified, is at first nearly colourless, but gradually acquires a brown tinge. Its odour is extremely unpleasant, its taste acrid. Its dose as an antispasmodic is ten drops.

OLEUM TEREBINTHINÆ VOLATILE PURISSIMUM.

Rectified Oil of Turpentine. [Ol. Terebinth. Rect.]

“ Take of Volatile Oil of Turpentine, one pound; Water, four pounds. Distil as long as any oil comes over.”

Oil of turpentine as obtained, by distillation, from what is termed common turpentine (the juice of the larch), is in general sufficiently pure; this process seems therefore unnecessary.

Two other empyreumatic oils are inserted in the London Pharmacopœia.

OLEUM ANIMALE. Animal Oil.

“ Take of Oil of Hartshorn, one pound. Distil three times.”

This oil is formed during the decomposition of bones by heat. By repeated distillations, it is rendered rather less offensive. It was once celebrated for its antispasmodic power, but has long been little used.

OLEUM PETROLEI. Oil of Petroleum, or Mineral Tar.

“ Distil Petroleum in a sand-bath”.

This has been used principally as an external stimulating application.

CHAPTER XVII.

OLEOSA.—OILY PREPARATIONS.

OLEUM AMMONIATUM, *vulgo Linimentum Volatile*. Ammoniated Oil, commonly called Volatile Liniment.

“Take of Olive Oil, two ounces; Water of Ammonia, two drachms. Mix them.”

A much stronger preparation is ordered in the London Pharmacopœia, LINIMENTUM AMMONIÆ FORTIUS, [Liniment. Ammon. Fort.] consisting of Water of Pure Ammonia, one ounce; Olive Oil, two ounces. Another is inserted under the title LINIMENTUM AMMONIÆ, composed of Water of Ammonia (or rather Carbonat of Ammonia), half an ounce; Olive Oil, an ounce and a half, which, both from the nature and proportion of its ingredients, is milder.

They are all used as rubefacients; and, for this purpose, the liniment of the Edinburgh College seems best adapted.

OLEUM LINI CUM CALCE. Linsed Oil with Lime.

“Take of Linseed Oil, Lime Water, of each equal parts. Mix them.”

This is used as an application to burns.

OLEUM CAMPHORATUM. Camphorated Oil.

“Take of Olive Oil, two ounces; Camphor, half an ounce. Mix them, so as that the camphor may be dissolved.”

This is a form under which camphor is frequently applied externally as a stimulant and anodyne.

OLEUM SULPHURATUM. Sulphurated Oil. [Ol. Sulphur.]

“Take of Olive Oil, eight ounces; Sublimed Sulphur, one ounce. Boil with a gentle fire, in a large iron pot, stirring constantly until they unite.”

This solution of sulphur in oil was once recommended as an expectorant, in a dose of twenty or thirty drops, and was used in asthma and phthisis, but is now altogether discarded from practice.

Besides this preparation, which has a place in the London Pharmacopœia, there is also ordered to be prepared in the same manner, a solution of oil in petroleum, PETROLEUM SULPHURATUM. Its qualities are the same with those of the other.

CHAPTER XVIII.

SALES et SALINA.—SALTS AND SALINE SUBSTANCES.

It is not easy to give a precise definition of the term Salt. It was formerly supposed to denote a body eminently sapid, soluble in water, crystallizable, fusible, and unflammable. But these properties are not possessed by many bodies supposed to belong to the class of Salts, and they belong to others which are arranged under other classes of chemical agents.

The definition of Salts, in the language of modern chemistry, seems rather to be taken from their composition, than from their properties. It is thus understood to be applied to the substances known by the name of Acids, to those entitled Alkalies, and to all the compounds formed by the Combinations of Acids with Alkalies, Earths, and Metallic Oxyds. The acids and alkalies are termed Primary, the other Secondary or Neutral Salts.

The general chemical qualities of the Acids, Alkalies, and Neutral Salts, and their nomenclature, have already been noticed in the first part of this work. The first saline combinations in the Pharmacopœia are those of the Acids.

ACIDUM ACETOSUM DESTILLATUM. Distilled Acetous Acid. [Acetum Distillat.]

“Distil eight pounds of Acetous Acid in glass vessels, with a gentle fire. The two pounds that first come over are to be rejected as too watery; the four pounds which follow are the distilled acetous acid. The residuum affords a still stronger acid, but too much burnt.”

Vinegar, as it is produced by fermentation, consists of acetous acid, largely diluted with water, and mixed with a number of other substances,—tartarous acid, extractive, mucilaginous, and saccharine matter. From these it is purified by distillation, but it is still largely diluted with water, as the pure acid is not even so volatile as water; and, in general, it receives from the distillation somewhat of an empyreumatic odour. The process should be conducted in glass vessels, as directed in the Pharmacopœia; as, from metallic ones, the acid would receive an impregnation that might prove noxious.

Distilled acetous acid is chiefly employed as a solvent of some vegetable substances, and in making some of the salts.

ACIDUM ACETOSUM FORTE. Strong Acetous Acid.

“Take of Dried Sulphat of Iron, one pound; Acetite of Lead, ten ounces. Rub them together. Put them into a retort, and distil from sand with a moderate fire, as long as any acid comes over.”

ACIDUM ACETOSUM. Acetous Acid. *Pharm. Lond.*

“Take of Verdigrise, in coarse powder, two pounds. Dry it perfectly in a bath of water, saturated with sea

salt. Then distil in a sand-bath, and distil the liquor a second time. Its specific gravity is, to that of distilled water, as 1050 to 1000."

These two processes furnish a powerful acid ; but the result of researches on this subject is such, that it is somewhat uncertain whether these two concentrated acids differ essentially from each other, and whether they differ except in strength from the diluted acetous acid.

In the first process, that of the Edinburgh Pharmacopœia, the sulphuric acid of the dried sulphat of iron combines with the oxyd of lead of the acetite of lead, and disengages the acetous acid, which, with a portion of water of crystallization, distils over. Its odour is pungent, its taste acrid, and its acid powers considerable. It seems most probable that it is merely the concentrated acetous acid.

In the second process, the acid contained in the verdigrise is expelled by the action of the heat from the oxyd of copper, with which in that substance it is combined. But it has been generally supposed, that at the same time it suffers a chemical change. According to the opinion once received, it receives a portion of oxygen from the oxyd of copper. The experiments of Chaptal appeared afterwards to prove that it was rather deprived of a portion of its carbon, which remained mixed or united with the oxyd of copper ; while Adet, and still more lately Darracq, have concluded from experiments, that no difference exists between those acids but in strength, the acetous acid being more diluted than the other, and, according to Darracq, containing a portion of mucilaginous and extractive matter. The concentrated acid from verdigrise is the Acetic Acid of the new nomenclature, the Radical Vinegar of the older chemists.

These strong acids are principally used as powerful stimulants, applied to the nostrils in languor and asphyxia. Their odour is pungent and grateful. They are capable also of acting as powerful rubefacients.

ACIDUM BENZOICUM. Benzoic acid. [Flores Benzoës.]

“Take of Benzoin in powder, any quantity. Put it into an earthen pot, to the mouth of which there has been previously adapted a paper cone; apply a gentle fire, that the acid may be sublimed. If it be contaminated with oil, let it be purified by solution in hot water, and crystallization.” (Or, according to the direction of the London College, its purification may be effected by mixing it with white clay, and again subliming it.)

This acid exists ready formed in benzoin, and all the balsams, and, as it is volatile, is easily sublimed by heat.

Another process, supposed to be more economical, was proposed by Scheele, in which the benzoin powdered is boiled with lime or potash, which combines with the benzoic acid; and the benzoat thus formed is decomposed by some other acid. The following is the process of this kind, inserted in the Prussian Pharmacopœia:

“Take of Powdered Benzoin, twenty-four ounces; Carbonat of Soda, eight ounces. Mix them, and boil in sixteen pounds of Water, stirring constantly for half an hour. Strain. To the remaining benzoin add six pounds of Water. Boil them together, and strain. Mix both liquors, and evaporate to two pounds. Filter the liquor, and add to it, Diluted Sulphuric Acid to saturation. The benzoic acid, precipitated under the form of a light grayish powder, is to be dissolved in boiling water; and the solution strained, while hot, through linen, is to be set aside to crystallize. The crystals are to be washed with cold water and dried.”

Benzoic acid has been supposed to possess some expectorant power, and, on this supposition, enters into the composition of the paregoric elixirs of the Pharmacopœias.

ACIDUM MURIATICUM. Muriatic Acid. [Acid. Muriat.]

“Take of Muriat of Soda, two pounds; Sulphuric Acid, sixteen ounces; Water, one pound. First expose the

muriat of soda in a pot to a red heat for a short time; when cold, put it into a retort. Then pour the acid, mixed with the water, and cold, on the muriat of Soda. Distil from a sand-bath with a moderate fire, as long as any acid comes over. Its specific gravity is to that of distilled water as 1170 to 1000."

This process is an example of single affinity. The sulphuric acid combines with the soda of the muriat of soda, and the muriatic acid is disengaged. It combines with the watery vapour, and is thus easily condensed. It has generally a yellowish tinge, from the presence of a small quantity of iron, from which it can be freed by a second distillation.

The principle use of this acid is for pharmaceutical purposes. It can scarcely be said to be employed as a medicine.

ACIDUM OXY-MURIATICUM. Oxy-muriatic Acid.

Though no process is inserted in any Pharmacopœia for the preparation of this acid, it is applied, both in its pure state and in its combinations, to medicinal uses.

Uncombined, it has been employed to destroy contagion, and is perhaps the most effectual of any of the agents that have been used for this purpose. It is prepared by adding to the materials from which muriatic acid is prepared, black oxyd of manganese, in the proportion of one-third of the weight of muriat of soda, and applying heat. The sulphuric acid disengages the muriatic acid, and this immediately attracting oxygen from the black oxyd of manganese, forms oxymuriatic acid; the vapours of which are diffused through the place where the contagion is to be destroyed.

Combined with potash, it forms a salt employed as an anti-venereal remedy. To prepare this salt, sixteen ounces of sub-carbonat of potash are dissolved in four pounds of water, and the solution is repeatedly agitated with eight ounces of lime, to abstract the carbonic acid. The solution of pure potash is to be poured into the bottles of Woulfe's apparatus, which are to be connected with

a retort, containing three pounds of muriat of soda, one pound of black oxyd of manganese, and two pounds of sulphuric acid, previously diluted with one pound and a half of water. On applying a moderate heat to the retort by a sand-bath, the oxy-muriatic acid is disengaged, and passes through the solution of potash. Instead of combining directly, however, with the potash, it suffers decomposition; one part of it returns to the state of muriatic acid, the other becomes, what is properly speaking, a super-oxygenated acid. Both saturate themselves with potash; and the two salts are separated, from their different degrees of solubility: the common muriat remains dissolved, the super-oxygenated muriat crystallizes. The crystals are washed with a small quantity of cold water. They are in small plates of a silvery white colour.

The medical uses of this salt have been already mentioned. It is given in syphilis in a dose of ten grains three or four times a-day.

ACIDUM NITROSUM. Nitrous Acid. [Acid. Nitros.]

“ Take of Pure Nitrat of Potash, beat to powder two pounds; Sulphuric Acid, sixteen ounces. The nitrat of potash being put into a glass retort, pour upon it the sulphuric acid, and distil from a sand-bath with a fire gradually raised, until the iron pot is of an obscure red heat. The specific gravity of this acid is to that of distilled water as 1550 to 1000.”

In this process the sulphuric acid combines with the potash, and disengages the nitric acid. The latter acid, however, partly from the heat employed in the distillation, and partly perhaps from the exertion of a disposing affinity, suffers a slight decomposition; a small portion of it loses part of its oxygen, and a quantity of nitrous gas is formed; this is absorbed by the nitric acid, and forms the nitrous, which is more or less coloured and fuming, according to the degree of heat employed in the distillation. The residuum is sulphat of potash, with an excess of sulphuric acid.

Nitrous acid is extensively employed as a pharmaceutical agent: from the facility with which it parts with oxygen, it is one of the most important. Its powers as a tonic and anti-syphilitic remedy, have been already considered. In the state of vapour, it has been employed under the form of fumigation to destroy contagion; and, though perhaps inferior to oxy-muriatic acid, it has the advantage that it can be applied without requiring the removal of the sick.

ACIDUM NITROSUM DILUTUM. Diluted Nitrous Acid.
[Acidum Nitros. Dilut.]

“Take of Nitrous Acid, Water, equal weights. Mix, avoiding the noxious vapour.

In combining nitrous acid with water, the greater part of the nitrous gas of the former is disengaged. The diluted acid is employed in a number of the chemical processes of the Pharmacopœia.

ACIDUM NITRICUM. Nitric Acid.

“Take of Nitrous Acid, any quantity. Put it into a retort, and a receiver being adapted, apply a very gentle heat until the reddest part shall have passed over, and the acid which remains in the retort shall have become nitric.”

By the heat applied, the nitrous gas contained in the nitrous acid, and which gives to it the yellow colour and highly fuming property, is expelled, and condenses in the receiver, combined still with a small portion of acid. The nitric acid remains colourless. It is applied to the same purposes as the nitrous. Little or no difference can exist between them in medicinal powers, but the nitric is perhaps more uniform in strength.

SPIRITUS æTHERIS NITROSI. Spirit of Nitrous Ether.
[Spirit. Æther. Nitros.]

“ Take of alkohol, three pounds; Nitrous Acid, one pound. Pour the alkohol into a large phial, placed in a vessel full of cold water, and add the acid gradually, with constant agitation. Close the phial lightly, and set it aside for seven days in a cool place; then distil the liquor with the heat of boiling water, into a receiver kept cool with water or snow, as long as any spirit comes over.”

This is a solution of nitrous ether in alkohol. To prepare pure nitrous ether is difficult, and not without danger, from the violent chemical action which takes place when so much nitrous acid is added as is necessary to convert the whole alkohol into ether. This pharmaceutical preparation therefore has been preferred, and, as a medicine, answers perhaps all the purposes which could be derived from the other. Even it requires caution in its preparation.

The theory of the action of acids on alkohol, and of the formation of ethers, is, notwithstanding modern researches, obscure; and that of nitrous ether is very imperfectly elucidated. It is ascertained, however, that during its production, portions of oxalic and acetous acids are formed; and the experiments of Bayen have clearly proved, that a very considerable portion of the nitric acid is decomposed or combined in such a manner with the principles of the alkohol, that it is no longer capable of saturating an alkali. Perhaps it may be inferred, that the acid, by parting with oxygen to the elements of the alkohol, causes the formation of the oxalic and acetous acids, and that the remaining elements of the alkohol unite to form the ether. It appears to contain more carbon than sulphuric ether.

The spirit of nitrous ether always contains a very sensible portion of acid, from which it may be freed by a second distillation, with the addition of magnesia or potash. But on this acid perhaps some of its virtues depend.

Its odour is extremely fragrant, its taste pungent and acidulous; it is very volatile and inflammable; soluble in alcohol and water. It is employed as a refrigerant and diuretic, sometimes as an antispasmodic. Its dose is from thirty to fifty drops.

ACIDUM SULPHURICUM DILUTUM. Diluted Sulphuric Acid. [Acidum Vitriolic. Dilut.]

“Take of Sulphuric Acid, one part; Water, seven parts (in the London Pharmacopœia eight parts). Mix them.”

The preparation of Sulphuric Acid being carried on on a large scale, for the purposes of commerce, no process is given for it in either of the Pharmacopœias. It is obtained by burning sulphur mixed with from one-eighth to one-tenth of nitrat of potash, in large leaden chambers. By the oxygenation of the sulphur, the acid is formed, and is absorbed by water placed in the bottom of the chamber. This liquor, when sufficiently acidulated, is concentrated by boiling in glass retorts, and an acid obtained thick and unctuous in its appearance, colourless and transparent, having a specific gravity of 1850.

Sulphuric acid prepared in this manner is never perfectly pure. It contains a quantity of sulphat of potash, and sometimes a small portion of sulphat of lead. From these it is in a great measure purified by dilution with water, the diluted acid being incapable of holding them dissolved. Its dose is also more manageable than that of the concentrated acid. As an astringent it is taken to the extent of thirty drops.

ACIDUM SULPHURICUM AROMATICUM. Aromatic Sulphuric Acid.

“Take of alcohol, two pounds; Sulphuric Acid, six ounces. Drop the acid gradually into the alcohol. Digest the mixture with a very gentle heat in a close vessel for three days, then add of Bark of Cinnamon, one

ounce and a half; of Ginger, one ounce. Digest again in a close vessel for six days; then strain through paper placed in a glass funnel."

Some chemical action may be exerted on the alcohol by the acid during the digestion, but the acidity is little impaired. The aromatics render it more pleasant, and the preparation may be considered as a grateful one for the exhibition of sulphuric acid. Its dose is thirty drops.

ÆTHER SULPHURICUS. Sulphuric Ether. [*Æther Vi-
triolicus.*]

"Take of Sulphuric Acid, Alcohol, of each thirty-two ounces. Pour the alcohol into a glass retort; capable of bearing a sudden heat. Then pour on the acid in an uninterrupted stream. Mix them gradually by frequent and gentle agitation; then immediately distil from a sand-bath, previously heated for this purpose, into a receiver kept cool with water or snow. But regulate the heat in such a manner that the liquor may be made to boil as soon as possible, and continue to boil until sixteen ounces have distilled over; then remove the retort from the sand. To the distilled liquor add two drachms of Potash; then distil again from a high-necked retort, with a very gentle heat, into a receiver kept cool, until ten ounces have passed over. If to the acid remaining in the retort after the first distillation, sixteen ounces of Alcohol be added, and the distillation repeated, ether will again be produced. And this may be often repeated."

In the formation of sulphuric ether, it is found by experiment that the alcohol suffers decomposition; a portion of its carbon is separated in a sensible form, and renders the residual liquor thick and dark coloured; a quantity of water is formed, and the remaining elements of the alcohol unite to form the ether. Ether differs from alcohol in containing less carbon, or rather more hydrogen; and this difference is established, not only by the facts with regard to its formation, but likewise by the comparative products of their combustion.

With regard to the agency of the sulphuric acid, by which these changes are effected in the composition of the alkohol, two opinions are at present maintained by chemists. According to the older doctrine, part of the sulphuric acid is decomposed; its oxygen combines with a portion of the hydrogen of the alkohol, and forms water; the balance of attractions among the elements of the alkohol being broken, carbon is deposited, and ether formed from a new combination of these remaining elements.

Fourcroy and Vauquelin have denied that any decomposition of the acid is necessary for the formation of ether. They suppose that it acts solely by a disposing affinity causing part of the oxygen and part of the hydrogen of the alkohol to enter into a binary combination to form water; whence results the exertion of new affinities, by which carbon is separated and ether formed.

The experiments from which this latter opinion has been deduced, are not unexceptionable; and the facts that no acid which does not part with oxygen can form ether, while acids which part with that principle readily, form it with facility, favour the supposition that the sulphuric acid occasions the formation of ether, by yielding part of its oxygen to the hydrogen of the alkohol.

The principal difficulty in conducting this process, is to stop it at the proper period; that is, when the formation of ether ceases, and sulphurous acid begins to be disengaged. This is best known by the neck of the retort being obscured with white fumes: when these appear, the fire must be immediately lowered or removed, as otherwise the liquor in the retort would swell up and pass over into the receiver.

The ether obtained by the first distillation is impure. It is diluted with water and alkohol, and impregnated generally with sulphurous acid. It is rectified, according to the directions in the Pharmacopœia, by distilling it a second time with a very gentle heat, with the addition of potash, which attracts the sulphurous acid; or, what succeeds better, with the addition of black oxyd of manganese, which converts that acid into sulphuric.

Ether properly prepared, has a penetrating diffusive odour, and a very pungent taste. It is highly volatile, evaporating rapidly at the common temperature of the atmosphere. It is soluble in ten parts of water, and combines with alkohol in every proportion.

Its virtues as a narcotic and antispasmodic have been already stated. Its dose is half a drachm.

ÆTHER SULPHURICUS CUM ALCOHOLE. Sulphuric Ether with Alkohol.

“Take of Sulphuric Ether, one part; Alkohol, two parts. Mix them.”

By this dilution of ether with alkohol, little is gained, except that it is more soluble in water. It was formerly known by the name of Spirit of Vitriolic Ether. The London College apply that name (*Spiritus Ætheris Vitriolici*) to ether obtained by the first distillation and unrectified. They order also a **COMPOUND SPIRIT OF VITRIOLIC ETHER** [*Spirit. Æther. Vitriolic. Composit.*] to be prepared by mixing two pounds of unrectified ether with three drachms of oil of wine,—a substance of an oily-like appearance, which distils over when the formation of ether has nearly ceased. All these preparations may be regarded as superfluous.

ÆTHER SULPHURICUS CUM ALCOHOLE AROMATICUS.
Aromatic Sulphuric Ether with Alkohol.

“This is made from the same materials, and in the same manner as the compound tincture of cinnamon, unless that Sulphuric Ether with Alkohol is used in place of diluted alkohol.”

The additions to the sulphuric ether in this formula, are of so little importance, that the preparation is scarcely ever used.

CARBONAS AMMONIÆ: *olim Ammonia Præparata*. Carbonat of Ammonia. [Ammonia Præparata.]

“ Take of Muriat of Ammonia, one pound; Carbonat of Lime, commonly called Chalk, dried, two pounds. Each being separately reduced to powder, mix them and sublime from a retort into a receiver kept cold.”

This process is an example of double elective attraction. The muriatic acid of the muriat of ammonia combines with the lime of the carbonat of lime, and the carbonic acid of the latter unites with the ammonia of the former. The carbonat of ammonia which is formed is sublimed, and is obtained in a crystalline cake. When the process is carried on in the large way, the sublimation is generally performed from an iron pot, to which the heat is directly applied.

According to the experiments of Mr. Davy, carbonat of ammonia varies much in the proportion of its ingredients from the heat applied in its preparation; that formed at a temperature of 300° containing 50 parts of alkali in the 100; while that produced at a temperature of 60° contained only 20 parts. Its smell is always pungent and ammoniacal: it is easily volatile, very soluble in water, and efflorescent on exposure to the air. Its medicinal applications are as a stimulant to the nostrils in fainting, and as a stimulant and diaphoretic, taken internally in a dose of from five to fifteen grains.

AQUA CARBONATIS AMMONIÆ: *olim, Aqua Ammoniæ*. Water of Carbonat of Ammonia. [Aq. Ammoniæ.]

“ Take of Muriat of Ammonia, Carbonat of Potash, of each sixteen ounces; Water, two pounds. To the salts, mixed and put into a glass retort, add the water; then distil from a sand-bath with a fire gradually raised, to dryness.”

In this preparation of carbonat of ammonia by the humid way, carbonat of lime could not be employed to decompose the muriat of ammonia; carbonat of potash is

therefore employed. The potash attracts the muriatic acid, the ammonia the carbonic acid. The carbonat of ammonia is volatilized, and dissolved by the watery vapour. The solution is applied to the same medicinal purposes as the concrete ammoniacal carbonat.

LIQUOR VOLATILIS, SAL, *et* OLEUM CORNU CERVI.
Volatile Liquor, Salt, and Oil of Hartshorn. *Pharm. Lond.*

“ Take of Hartshorn, ten pounds. Distil, increasing the fire gradually. A volatile liquor, salt, and oil, come over. The oil and the salt being separated, distil the liquor three times. To the salt add an equal weight of prepared chalk, and sublime three times, or until it become white. The same volatile liquor, salt, and oil, may be obtained from any of the parts of animals except fat.”

By exposing bones to heat, the gelatin they contain suffers decomposition; its principles enter into new combinations, forming chiefly carbonat of ammonia and empyreumatic oil. These are the products of the above process; the carbonat of ammonia being partly dissolved by the water which distils over, and obtained partly in a concrete state. It is scarcely possible, however, to free it entirely from the empyreumatic oil, which renders it nauseous; and, though at one time it was supposed to be possessed of some peculiar virtues, it is now justly rejected from practice; and the carbonat of ammonia, obtained pure by the preceding processes, is preferred.

AQUA AMMONIÆ: *olim, Aqua Ammoniæ Causticæ.* Water of Ammonia. [Aq. Ammoniæ Puræ.]

“ Take of Muriat of Ammonia, sixteen ounces; Lime, fresh prepared, two pounds; Water, six pounds. To one pound of water in an iron or earthen vessel, add the lime broken down, and close the vessel for twenty-four hours, until the lime fall into a fine powder, which put into a retort. To this add the Muriat of Ammonia, dissolved in five pounds of Water, and, shutting the mouth of the re-

tort, mix them by agitation. Lastly, distil with a heat so moderate, that the operator can easily apply his hand to the retort, into a receiver kept cold, until twenty ounces have distilled over. In this distillation the vessels are to be so luted as to confine effectually the penetrating vapours."

The lime in this process attracts the muriatic acid of the muriat of ammonia, and the ammonia is disengaged. By itself it is incondensable, but it combines with the watery vapour, and forms an aqueous solution. To conduct the process to advantage, a series of receivers is necessary in which water is disposed, to absorb entirely the ammoniacal gas.

When water is perfectly saturated with ammonia, 100 grains are found to combine with 34; but, in the usual mode of preparing this solution, this perfect saturation is never effected. The solution has a strong pungent smell, a very acrimonious taste, and inflames the skin. It is used in medicine as a powerful stimulant and diaphoretic internally, in a dose of twenty drops; externally, as a stimulant and rubefacient.

ALCOHOL AMMONIATUM, *sive Spiritus Ammoniaë*. Ammoniated Alcohol. [*Spiritus Ammoniaë*.]

"Take of Diluted Alcohol, four pounds; Muriat of Ammonia, four ounces; Carbonat of Potash, six ounces. Mix, and draw off by distillation with a gentle fire, two pounds."

Though in this process carbonat of ammonia is the principal product, from the decomposition of the muriat of ammonia by the carbonat of potash, yet, from the potash not being fully saturated with carbonic acid, a quantity of pure ammonia is disengaged, and combines with the alcohol. A part of the water also of the diluted alcohol distilling over, dissolves a portion of the carbonat of ammonia. The compound has the pungent ammoniacal smell. It is used principally as the menstruum of some vegetables with which ammonia coincides in medicinal operation.

ALCOHOL AMMONIATUM AROMATICUM, *sive Spiritus Ammoniae Aromaticus*. Aromatic Ammoniated Alcohol. [Spirit. Ammon. Comp.]

“ Take of Spirit of Ammonia, eight ounces; Volatile Oil of Rosemary, one drachm and a half; Volatile Oil of Lemon, one drachm. Mix so as to dissolve the oils.” In the London Pharmacopœia, Oil of Cloves is ordered in place of oil of rosemary.

By this combination of the ammonia with the alcohol, and the addition of the aromatic oils, it is rendered more grateful than the water of ammonia. This preparation is therefore sometimes used in preference to the other, as a stimulating perfume, and even for internal exhibition. Its dose is from fifteen to thirty drops.

ALCOHOL AMMONIATUM FOETIDUM, *sive Spiritus Ammoniae Fœtidus*. Fœtid Ammoniated Alcohol. [Spirit. Ammon. Fœtid.]

“ Take of Spirit of Ammonia, eight ounces; Assafœtida Gum-Resin, half an ounce. Let them digest in a close vessel for twelve hours; then distil eight ounces by the heat of a water-bath.”

The impregnation of the ammoniated alcohol with part of the assafœtida in this process, though it may communicate a fœtid smell, can scarcely add to its activity. It has been given in hysteria in a dose of thirty drops.

SPIRITUS AMMONIÆ SUCCINATUS. *Pharm. Lond.* Succinated Spirit of Ammonia.

“ Take of Alcohol, one ounce; Water of Pure Ammonia, four ounces; Rectified Oil of Amber, one scruple; Soap, ten grains. Digest the soap and the oil of amber in the alcohol, until they are dissolved. Then add the water of pure ammonia, and mix by agitation.”

This has been principally used as a stimulating perfume, under the name of *Eau de Luce*. For the preparation of the compound, sold under this name, the above formula is imperfect.

CARBONAS POTASSÆ. Carbonat of Potash. [Kali Præparatum.]

“ Let impure Carbonat of Potash, (which in English is named Pearl-Ashes,) be put into a crucible, and brought to a red heat, that the oily impurities, if any are present, may be burnt out; then rubbing it with an equal weight of water, mix them thoroughly by agitation. The liquor, after the impurities have subsided, being poured off into a clean iron-pot, is to be boiled to dryness, stirring the salt constantly towards the end of the boiling, that it may not adhere to the vessel.”

The Pearl-Ashes of commerce are obtained by the incineration of the wood of land vegetables. They consist of sub-carbonat of potash, with sulphat and muriat of potash, siliceous earth, and a small quantity of metallic matter. From these they are in a considerable degree purified by the present process. The one given in the London College is, in one respect, preferable; the solution obtained from the pearl-ashes being evaporated till a pellicle appears on its surface, and being then set aside, before farther evaporation, that the sulphat or muriat of potash which it may contain in solution may be separated by crystallization. The salt obtained by either process is a sub-carbonat of potash, or potash imperfectly saturated with carbonic acid. It is in white grains, is deliquescent, and possesses the alkaline properties.

CARBONAS POTASSÆ PURISSIMUS, *olim, Sal Tartari.*
Pure Carbonat of Potash, *formerly Salt of Tartar.*

“ Take of impure Super-Tartrite of Potash, any quantity. Having wrapped it up in moist bibulous paper, or put it into a crucible, burn it into a black mass, by placing it among live coals. Having reduced it to powder, subject it to a moderate heat, in an open crucible, until it become white, or at least of an ash-gray colour, care being taken that it do not melt. Then dissolve it in warm water, strain the liquor through linen, and evaporate it in

a clean iron vessel, stirring the matter constantly towards the end of the evaporation, with an iron spoon, that it may not adhere to the bottom of the vessel. A very white salt will remain, which is to be left a little longer on the fire, until the bottom of the vessel is nearly at a red heat. When cold, it is to be kept in glass vessels, well stopt."

By exposing the super-tartrate of potash to heat, the tartarous acid is decomposed. Part of its carbon and oxygen unite, and form carbonic acid, which is attracted by the potash; and, by continuing the heat, the remaining carbonaceous matter is burnt out. By dissolving the saline matter, the portion of lime, and any other earthy or metallic matter which the super-tartrate may have contained are separated, and, by evaporation, a salt is obtained, which, like the former, is a sub-carbonat of potash, but more pure.

The usès of this salt as an antacid and diuretic, have been already mentioned.

AQUA POTASSÆ, vulgo Lixivium Causticum. Water of Potash. [Aqua Kali Puri.]

"Take of newly prepared Lime, eight ounces; Carbonat of Potash, six ounces. Put the lime into an iron or earthen vessel, with twenty-eight ounces of warm water. The ebullition being finished, immediately add the salt; and the whole being well mixed, close the vessel till they become cold. Let the cold materials, previously well agitated, be poured into a glass funnel, the throat of which is obstructed with clean linen. Cover the upper orifice of the funnel, while the neck of it is inserted in another glass vessel, that the water of potash may gradually drop through the linen into the lower vessel. When it first ceases to drop, pour into the funnel some ounces of water, but cautiously, so that it may swim above the matter. The water of potash will again begin to drop. In this manner the affusion of water is to be repeated, until three pounds have filtered, which will be in the space of two or three days. The upper parts of the liquor are to be mixed with the lower by agitation, and it is to be kept in a vessel well stopt."

Lime having a stronger attraction to carbonic acid than potash has, attracts that acid from the sub-carbonat, and leaves the potash pure. Strictly speaking, indeed, the whole of the carbonic acid is not abstracted; since, in consequence of the law of chemical affinity, that quantity, to a certain extent, counteracts the force of attraction, a part of the carbonic acid still remains combined with the potash, and, to obtain potash perfectly pure, a process much more operose is necessary. But, for any medicinal or pharmaceutic purpose, the potash existing in this solution is in a state of sufficient purity, at least if the directions in the Pharmacopœia are strictly observed. Its medicinal uses as a lithontriptic and antacid have been already considered.

AQUA SUPER-CARBONATIS POTASSÆ. Water of
Super-Carbonat of Potash.

“Take of Water, ten pounds; Pure Carbonat of Potash, one ounce. Dissolve, and expose the solution to the current of Carbonic Acid Gas which arises from three ounces of Powdered Carbonat of Lime, three ounces of Sulphuric Acid, and three pounds of Water, gradually and cautiously mixed. The chemical apparatus invented by Dr. Nooth is well adapted to this preparation. But, if a larger quantity of the solution is required, the apparatus of Woulfe is preferable. The colder the air is, and the greater the pressure, the better will be the liquor. It ought to be kept in vessels well stopt.”

Potash, when used as a lithontriptic, irritates the stomach and bladder so much, that its use cannot well be long continued. But, when super-saturated with carbonic acid, as it is in this preparation, it is much more pleasant and less irritating; and, though its lithontriptic or real solvent power is diminished, or perhaps entirely lost, it is capable of acting as a palliative, and of being continued for any length of time. It is taken to the extent of one, or even two pounds in the day. When properly prepared, it is pungent and acidulous, and sparkles when poured into a glass.

CARBONAS SODÆ, olim *Sal Alkalinus Fixus Fossilis Purificatus*. Carbonat of Soda. [Natron Præparatum.]

“Take of Impure Carbonat of Soda, any quantity. Bruise it, and boil in water until all the salt is dissolved. Strain the solution through paper, and evaporate it in an iron vessel, that after it has cooled, crystals may form.”

Impure Carbonat of Soda, the Barilla of commerce, is obtained from the incineration of certain marine plants. It consists of carbonat of soda, with charcoal, oxyd of iron, and various other impurities. From these it is in a great measure freed by solution and crystallization. The crystals are rhomboidal, and contain a large quantity of water of crystallization. This salt has been used principally as a lithontriptic, under the form of the watery solution super-saturated with carbonic acid, or that of the Soda Pill.

AQUA SUPER-CARBONATIS SODÆ. Water of Super-carbonat of Soda.

“This is prepared from ten pounds of Water, and two ounces of Carbonat of Soda, in the same manner as the water of super-carbonat of potash.”

It is used as a lithontriptic, in the same dose as the water of super-carbonat of potash, and has generally been preferred to it, on the supposition of being more pleasant.

AQUA ACETITIS AMMONIÆ, vulgo *Spiritus Mindereri*. Water of Acetite of Ammonia. [Aqua Ammoniæ Acetatæ.]

“Take of Carbonat of Ammonia, any quantity. Pour on it as much Distilled Acetous Acid as may be necessary to saturate exactly the ammonia.”

In this preparation, the acetous acid combines with the ammonia, and the carbonic acid is disengaged with effe-

vescence. The acetite of ammonia remains dissolved in the water. As the strength of distilled vinegar is not always the same, that of this solution must be variable; an inconvenience not easily obviated. It is given as a diaphoretic, in divided doses of one ounce.

ACETIS POTASSÆ. Acetite of Potash. [Kali Acetatum.]

“ Take of Pure Carbonat of Potash, any quantity. Boil it with a gentle heat in four or five times its weight of Distilled Acetous Acid, and add more acid at different times, until, on the watery part of the former portion being nearly dissipated by evaporation, the acid newly added excite no effervescence: this will happen when about twenty parts of acid have been consumed. Then let it be slowly dried. Let the remaining impure salt be liquefied with a gentle heat, for a short time; then dissolved in water, and strained through paper. If the melting has been properly done, the strained liquor will be limpid; if not, of a brown colour. Afterwards evaporate with a very gentle heat this liquor, in a shallow glass vessel, stirring the salt while it concretes, that it may more quickly be brought to dryness. Lastly, the acetite of potash ought to be kept in a glass vessel, well closed, that it may not liquefy by the action of the air.”

It is obvious, that, in this process, the acetous acid combines with the potash, disengaging the carbonic acid. The acetite of potash, obtained by the evaporation, is of a brownish colour, from the presence, either of some extractive matter contained in the vinegar, or of carbonaceous matter, from a partial decomposition of the acid. It is freed from this by the fusion which is directed; and, by the second solution and evaporation, it is obtained in the form of a white foliated mass, extremely deliquescent.

This salt was at one time celebrated as a diuretic, in a dose of one or two drachms; but it has now nearly fallen into disuse.

POTASSA, *olim Causticum Commune Acerrimum*. Potash.
[Kali Purum.]

“ Take of Water of Potash, any quantity. Evaporate it in a covered clean iron vessel, until, when the ebullition is finished, the saline matter flow smoothly like oil, which will happen before the vessel is at a red heat. Then pour it on a clean iron plate; cut it into small masses before it hardens, and immediately put them into a phial well stopt.”

Potash in this form is used as a caustic; it quickly erodes animal matter, and, mixed with soap, has been used to open an ulcer.

POTASSA CUM CALCE, *olim Causticum Commune Mitius*.
Potash with Lime. [Calx cum Kali Puro.]

“ Take of Water of Potash, any quantity. Evaporate it to one-third in a covered iron vessel; then mix with it as much newly slaked Lime as may be sufficient to give it the consistence of a solid paste, which is to be kept in a stopt vessel.”

As a caustic, this is milder than the former, and is also less deliquescent.

SULPHAS POTASSÆ: *olim, Tartarum Vitriolatum*. Sulphat of Potash. [Kali Vitriolat.]

“ Take of Sulphuric Acid, diluted with six times its weight of Water, any quantity. Put it into a large glass vessel, and gradually drop into it, of Carbonat of Potash, dissolved in six times its weight of Water, as much as may be necessary to the perfect saturation of the acid. The effervescence being over, strain the liquor through paper; and, after due exhalation, put it aside, that crystals may form. Sulphat of Potash may also be conveniently made, by dissolving the residuum of the distillation of Nitrous Acid in Warm Water, and saturating it with Carbonat of Potash.”

In the former of these processes, the sulphuric acid unites with the potash of the carbonat of potash, and expels the carbonic acid with effervescence. In the latter, which is the one generally followed, the excess of sulphuric acid attached to the sulphat of potash, which remains after the distillation of nitrous acid, is saturated by the addition of a sufficient quantity of potash. The salt forms an irregular crystalline mass; it has a very bitter taste, and is sparingly soluble in water. Its virtues are those of a cathartic; its dose half an ounce.

SULPHAS POTASSÆ CUM SULPHURE, *olim Sal Polychrestus*. Sulphat of Potash with Sulphur.

“Take of Nitrat of Potash in powder, Sublimed Sulphur, equal weights. Throw them well mixed, in small quantities at a time, into a red-hot crucible. The deflagration being finished, let the salt cool, and keep it in a glass phial, well stopt.”

The nitrat of potash being decomposed by the red heat, affords oxygen to the sulphur, in such proportions as to convert it into sulphuric and sulphurous acids. Both acids are attracted by the potash. In its medicinal qualities, this saline compound does not appear to differ from the sulphat of potash; and it is soon converted into it by exposure to the air.

TARTRIS POTASSÆ, *olim Tartarum Solubile*. Tartrite of Potash. [Kali Tartarisatum.]

“Take of Carbonat of Potash, one pound; Super-Tartrite of Potash, three pounds, or as much as may be necessary; Boiling Water, fifteen pounds. To the carbonat of potash dissolved in the water, add, by small quantities, the Super-Tartrite of Potash rubbed to a fine powder, as long as it excites effervescence, which generally ceases before three times the weight of the carbonat of potash have been thrown in. Then strain the liquor, when cold, through paper; and, after due exhalation, put it aside that crystals may form.”

The excess of tartarous acid in the super-tartrite of potash, is saturated by the potash of the carbonat of potash, and the proper neutral salt formed. It is not easily crystallized. In its preparation, therefore, the solution is usually evaporated to dryness.

This salt has a bitter taste; it is very soluble in water, requiring only four parts of cold water for its solution. As a purgative, it is given in the dose of one ounce.

TARTRIS POTASSÆ ET SODÆ, *olim Sal Rupellensis.*

Tartrite of Potash and Soda. [Natron Tartarisatum.]

“ This is prepared from Carbonat of Soda and Super-Tartrite of Potash, in the same manner as Tartrite of Potash.”

The excess of tartarous acid in the acidulous tartrite of potash, being saturated in this preparation with soda, a triple salt is formed. It crystallizes in rhomboidal prisms; is soluble in five parts of water at 60°; has a bitter saline taste. It is employed as a cathartic, in the dose of one ounce; and is often preferred, as being less disagreeable than the greater number of the saline cathartics.

PHOSPHAS SODÆ. Phosphat of Soda.

“ Take of Bones, burnt to whiteness and reduced to powder, ten pounds; Sulphuric Acid, six pounds; Water, nine pounds. Mix the powder in an earthen vessel with the sulphuric acid; then add the water, and again mix. Keep the vessel in a water-bath for three days; at the end of which, dilute the matter, by adding other nine pounds of Boiling Water, and strain through a strong linen-cloth, pouring over it gradually, boiling water, until the whole acid is washed out. Put aside the strained liquor, that the impurities may subside, from which pour it off, and, by evaporation, reduce it to nine pounds. To this liquor, again poured off from the impurities, and heated in an earthen vessel, add Carbonat of Soda dissolved in warm water, until the effervescence cease.

Then strain, and put it aside, that crystals may form. These being removed, add, if necessary, to the liquor, a little Carbonat of Soda, that the phosphoric acid may be exactly saturated; and prepare it by evaporation, again to form crystals, as long as these can be produced. Lastly, let the crystals be kept in a vessel well stopt."

The white residuum of burnt bones consists chiefly of phosphat of lime. The sulphuric acid decomposes it, by combining with the lime; the phosphoric acid, which is disengaged, dissolves, however, a portion of undecomposed phosphat of lime, forming a soluble compound. When carbonat of soda is added to the acidulous liquor obtained by washing the materials, the soda combines with the free phosphoric acid; the neutral phosphat of lime, which was combined with that acid, is precipitated, and the phosphat of soda crystallizes on evaporation of the strained liquor. Its crystals are rhomboidal, efflorescent, and require for solution only four parts of cold water. They consist, according to Thenard, of nineteen of soda, fifteen of acid, and sixty-six of water. Its taste is purely saline, without any bitterness; its medicinal operation is that of a mild cathartic, and, from being less nauseous to the taste than the other salts, it is entitled to preference. Its dose is one ounce.

SULPHAS SODÆ: *olim, Sal Glauberi.* Sulphat of Soda.
[Natron Vitriolatum.]

"Dissolve the Acidulous Salt remaining after the distillation of muriatic acid, in Water; and add to it Chalk, to remove the superfluous acid. Put it aside until the impurities have subsided; then, having poured off the liquor, and strained it through paper, reduce it by evaporation, that crystals may be formed."

In the decomposition of muriat of soda by sulphuric acid, to prepare muriatic acid, more sulphuric acid is used than is barely sufficient; and hence the necessity of saturating this excess by the addition of chalk or carbonat of lime. The neutral sulphat of soda crystallizes in hexhaedral prisms; they are efflorescent and soluble

in rather less than three parts of cold water. This salt has been long in use as a cathartic, and its value is only lessened by its nauseous taste. Its dose is an ounce and a half.

SULPHURETUM POTASSÆ: *olim, Hepar Sulphuris.*
[Kali Sulphuratum.]

“Take of Carbonat of Potash, Sublimed Sulphur, of each eight ounces. Having rubbed them together, put them into a large coated crucible; and a cover being adapted to it, apply the fire to it cautiously, until they melt. The crucible, after it has cooled, being broken, remove the sulphuret, and preserve it in a phial well stopd.”

During the fusion of these two substances, the sulphur and potash combine, and the carbonic acid is disengaged. The compound is easily fusible, and is of a brown colour, and inodorous. It is immediately partially decomposed by water, and portions of sulphat of potash and sulphurated hydrogen formed. It has been proposed to be used as an antidote to some of the metallic poisons, from the supposition that the sulphur would combine with the metallic preparation, and render it inert. From a similar theory, it has been imagined that it might obviate the effects of mercury on the system when these are too violent: but it is very seldom had recourse to with either intention. The dose in which it has been proposed to be given, is from ten to twenty grains three or four times a-day. It is said, in some cases of cancer, to have increased the efficacy of cicuta as a palliative, in doses of five grains.

HYDRO-SULPHURETUM AMMONIÆ. Hydro-sulphuret of Ammonia.

“Take of Water of Ammonia, four ounces. Expose it in a chemical apparatus to the stream of gas which arises from Sulphuret of Iron, four ounces; Muriatic Acid, eight ounces, previously diluted with two pounds

and a half of Water. The sulphuret of iron for this purpose is conveniently prepared from three parts of Purified Iron Filings, and one part of Sublimed Sulphur, mixed together, and exposed in a covered crucible, to a moderate heat, until they unite."

The sulphurated hydrogen is produced in this process by the muriatic acid *disposing* the iron to decompose part of the water. The hydrogen disengaged immediately combines with a portion of the sulphur present, and this compound escaping in the state of gas, is passed through the water of ammonia, with which it unites, and forms a liquor of a dark green colour, and very fœtid odour.

The medicinal qualities of hydro-sulphuret of ammonia have been already noticed. It is capable of powerfully depressing the actions of the stomach and general system, and has been used, principally in diabetes, in a dose of three or four drops, three or four times a-day.

MURIAS BARYTÆ. Muriat of Barytes.

"Take of Sulphat of Barytes, two pounds; Wood Charcoal in powder, four ounces. Roast the sulphat, that it may be the more easily reduced to a fine powder, with which is to be mixed the powdered charcoal. Put the matter into a crucible, to which a cover is adapted, and urge it with a strong fire for six hours. Put the matter well rubbed into six pounds of Boiling Water, in a closed glass or earthen vessel, and mix them by agitation, preventing, as much as possible, the access of the air. Let the vessel stand in a water-bath, until the part not dissolved has subsided; then pour off the liquor. Pour on the residuum four pounds of boiling water, which, after agitation and subsidence, add to the former liquor. While it is yet hot, or, if it has cooled, after it has been heated, drop into it Muriatic Acid as long as effervescence is excited. Then strain it, and evaporate, that it may crystallize."

Sulphat of Barytes may be decomposed by carbonat of potash by double affinity, and perhaps this is the least troublesome process; but, when done with a view to the

medicinal application of the barytes, it has been supposed defective, as it does not separate the metallic substances with which the native sulphat is so frequently intermixed. The process of decomposing it, therefore, by charcoal, has been deemed preferable. The carbonaceous matter attracts the oxygen of the sulphuric acid; the sulphur remains united with the barytes. This sulphuret of barytes, as well as a portion of hydro-sulphuret formed during the solution, are soluble in water; on dropping in muriatic acid, it combines with the barytes, the sulphur is precipitated, and the sulphurated hydrogen disengaged. By straining and evaporating the liquor, the muriat of barytes is obtained crystallized. It is used under the form of solution, for which also a formula is given.

SOLUTIO MURIATIS BARYTÆ. Solution of Muriat of Barytes.

“ Take of Muriat of Barytes, one part. Distilled Water, three parts. Dissolve.”

The saturated solution of muriat of Barytes was introduced by Dr. Crawford, as a remedy in scrofulous affections, and has been regarded as a tonic of considerable power. It is by no means inert, and the dose requires to be regulated with some care. Five drops are given twice a-day, and gradually increased to twenty or more.

SOLUTIO MURIATIS CALCIS. Solution of Muriat of Lime.

“ Take of Pure Carbonat of Lime (namely White Marble), in small pieces, nine ounces; Muriatic Acid, sixteen ounces; Water, eight ounces. Mix the acid with the water, and add gradually the pieces of carbonat of lime. The effervescence being finished, digest for an hour. Pour off the liquor, and reduce it by evaporation to dryness. Dissolve the residuum in its weight and a half of water, and strain.”

The muriatic acid, it is obvious, combines with the lime, and disengages the carbonic acid. The solution of muriat of lime has been strongly recommended as a tonic, similar, and not inferior to the muriat of barytes. The dose is from fifteen to twenty grains of the dried salt, or thirty drops of the saturated solution.

CARBONAS MAGNESIÆ: *olim, Magnesia Alba.* Carbonat of Magnesia. [Magnesia Alba.]

“ Take of Sulphat of Magnesia, Carbonat of Potash, of each equal weights. Let them be dissolved separately in twice their weight of warm water, and either strained or otherwise freed from impurities. Then mix them, and immediately add eight times their weight of boiling water. Boil the liquor a little, stirring it at the same time; then allow it to remain at rest, until the heat be diminished a little, and strain it through linen, on which the carbonat of magnesia will remain. Wash it with pure water, until it be perfectly tasteless.

This is an example of double affinity, the sulphuric acid of the sulphat of magnesia combining with the potash of the carbonat of potash, and the carbonic acid uniting with the magnesia. The use of adding the boiling water, and boiling the liquor, is, partly to dissolve the sulphat of potash, which is a salt sparingly soluble, and partly to give the carbonat of magnesia a smoothness which it has not when this precaution is not observed. Carbonat of magnesia, however, is generally prepared on a large scale from the Bittern, or liquor remaining after the crystallization of muriat of soda from sea-water, which is principally a solution of muriat of magnesia: and there are some niceties of manipulation requisite to give it the lightness and smoothness which are valued as marks of its goodness.

Carbonat of magnesia, properly prepared, is nearly insipid; is extremely light, white, and smooth to the touch; it is insoluble in water. It is given as an antacid in a dose from a scruple to a drachm; and the magnesia, by combining with acid in the stomach, forms a salt which acts as a laxative.

MAGNESIA: *olim, Magnesia Usta*. Magnesia. [Magnesia Usta.]

“ Let Carbonat of Magnesia be exposed in a crucible, to a red heat, for two hours. Then preserve it in glass phials well stopt.”

By a red heat, the carbonic acid of the carbonat is expelled, and the pure magnesia remains. It loses about half its weight. A smaller quantity, therefore, of the pure magnesia, will produce the same effect as a larger of the carbonat. It is preferred to the latter, where, from the abundant acidity on the stomach, flatulence is occasioned by the disengagement of carbonic acid when the carbonat is employed.

CHAPTER XIX.

METALLICA.—METALLIC PREPARATIONS.

THE following metals are employed in medical practice: Silver, Quicksilver, Copper, Iron, Tin, Lead, Zinc, Antimony, and Arsenic.

It has already been observed, that metals, in their pure state, do not appear to exert any action on the living system; their combinations only possess medicinal virtues.

The oxydation of metals, and the combination of their oxyds with acids, are the chemical changes which communicate to them activity. In general they are more active, in proportion as they are more highly oxydated, and are still more so when combined with acids. Oxygen is not, however, to be regarded, according to a modern hypothesis, as the source of their activity: each metal possesses powers, which, though increased or diminished according to the degree of oxydation, are peculiar to itself, and remain in all its preparations.

ARGENTUM.—SILVER.

NITRAS ARGENTI: *olim, Causticum Lunarc.* Nitrat of Silver. [Argentum Nitratum.]

“ Take of the Purest Silver, extended in plates and cut, four ounces; Diluted Nitrous Acid, eight ounces; Distilled Water, four ounces. Dissolve the silver in a phial with a gentle heat, and evaporate the solution to dryness. Then put the mass into a large crucible, which is to be put on the fire, which must be at first gentle, and gradually increased until the mass flow like oil. Then pour it into iron pipes, warmed and rubbed with grease. Lastly, keep it in a glass vessel well stopt.”

The silver in this process is oxydated and dissolved by the nitrous acid. By the subsequent fusion, part of the acid is expelled, so that this is rather a sub-nitrat then a nitrat of silver. It is a strong caustic, and possesses the advantage of being easily applied. It is therefore the one in most general use.



ANTIMONIUM.—ANTIMONY.

SULPHURETUM ANTIMONII PRÆPARATUM: *olim, Antimonium Præparatum.* Prepared Antimony. [Antimonium Præparatum.]

“ Let Sulphuret of Antimony be prepared in the same manner as carbonat of lime.”

This preparation has been already noticed, (page 233.)

OXIDUM ANTIMONII CUM SULPHURE VITRIFICATUM: *olim, Vitrum Antimonii.* Vitrified Sulphurated Oxyd of Antimony. [Antimonium Vitrificatum.]

“ Strew Sulphuret of Antimony, rubbed to a coarse powder like sand, on a shallow unglazed earthen vessel, and apply to it a gentle fire, that the sulphuret of anti-

mony may be slowly heated; at the same time stirring constantly the powder, that it may not run into lumps. White vapours, smelling of sulphur, will arise from it. When these, while the same degree of heat is kept up, cease, increase the heat a little, that vapours may again exhale; and proceed in this manner, until the powder, raised at length to a red heat, exhales no more vapours, This powder being put into a crucible, is to be melted with a strong fire, until it assume the appearance of fused glass; then pour it upon a heated brass plate."

In the first stage of this process, the greater part of the sulphur of the sulphuret of antimony is dissipated, and the antimony is imperfectly oxydated. This oxyd is then vitrified by the more intense heat applied. According to Thenard, it contains sixteen of oxygen in the one-hundred; but it is farther combined, according to the researches of Proust, with a portion of sulphuret of antimony; and, from the experiments of Vauquelin, it appears also to contain from nine to ten parts in the one-hundred of siliceous earth, derived probably from the crucibles in which it is prepared. It is violent and at the same time uncertain in its operation, and is not used but in preparing some of the other antimonials.

OXIDUM ANTIMONII VITRIFICATUM CUM CERA:
olim, Vitrum Antimonii Ceratum. Vitrified Oxyd of
 Antimony with Wax.

"Take of Yellow Wax, one part; Vitrified Sulphurated Oxyd of Antimony, eight parts. To the wax, melted in an iron vessel, add the oxyd rubbed to powder, and roast them with a gentle fire, for a quarter of an hour, stirring constantly with a spatula; then pour out the matter, which, when it is cold, rub to powder."

It is probable that during this process the oxyd of antimony loses part of its oxygen, from the carbonaceous matter of the wax attracting it, as it diminishes in weight, and becomes much milder in operation. Though once highly recommended in dysentery, it may be regarded as an obsolete remedy. The dose in which it was given,

was from five to fifteen grains, and its principal operation was that of a cathartic.

OXIDUM ANTIMONII CUM PHOSPHATE CALCIS:
olim, Pulvis Antimonialis. Oxyd of Antimony with
 Phosphat of Lime. [*Pulvis Antimonialis.*]

“Take of Sulphuret of Antimony, rubbed to a coarse powder, Hartshorn Shavings, of each equal parts. Mix and throw them into a wide iron pot, red hot, and stir them constantly until they are burnt into a matter of an ash colour, which remove from the fire, rub to powder, and put into a coated crucible. Lute to this crucible another inverted, in the bottom of which a small hole is drilled; apply the fire, which is to be gradually raised to a white heat, and kept at this increased heat for two hours. Lastly, rub the matter, when cold, into a very fine powder.”

This has been introduced into the Pharmacopœias, as affording a preparation similar to the celebrated empirical remedy, *James's Powder*. For the process we are indebted to Dr. Pearson. By analysis he found the genuine powder of James to consist of forty-three parts of phosphat of lime, and fifty-seven of an oxyd of antimony, part of which was vitrified; and by the above formula he was able to prepare a powder similar to it in qualities and chemical composition. The theory of the process is sufficiently obvious. During the first stage, the animal matter of the bones is decomposed and burnt out; the sulphur of the sulphuret of antimony, is expelled, and the metal imperfectly oxydated. In the second, the metal is more completely oxydated, partially vitrified, and perhaps brought into combination with the phosphat of lime, which is the residuum of the bones. From Mr. Chenevix's experiments, it appears, that, in this preparation, more of the oxyd of antimony is vitrified than in the genuine James's powder.

Mr. Chenevix has likewise proposed a method of obtaining this preparation in the humid way. It consists in dissolving equal weights of the white powder, precipitated

by water, from muriat of antimony, and of pure phosphat of lime, in as much muriatic acid as may be necessary, with the assistance of a moderate heat, and pouring this solution into ammonia diluted with distilled water. The ammonia combines with the muriatic acid, and the oxyd of antimony and phosphat of lime are thrown down intimately mixed. This preparation may be more uniform in composition than that obtained by heat, as, in the latter, variations are liable to be introduced, from the different degrees of oxydation, of which antimony is susceptible, and from the volatility of the antimonial oxyds; but it is uncertain if it be the same chemical compound, or if it produce the same medicinal effects. It is believed, that, in the powder prepared by the old process, the oxyd of antimony and phosphat of lime are in a state of combination, while in that of Mr. Chenevix, they are only in a state of mixture, and in the former, part of the oxyd is also always vitrified; differences which may give rise to some difference in their powers.

James's powder has been long celebrated as a remedy in febrile affections. It acts as a very general evacuant, occasioning sweat, purging, and frequently vomiting; and, by this general action, appears to arrest the progress of the disease. Its dose is five or six grains, repeated every six hours, till its effects are obtained. It is better adapted to fevers of an inflammatory nature than to those of the typhoid kind.

It has been affirmed, that the preparation obtained by the above process, is not so certain nor so powerful in its operation, as the powder of James, eight grains of the former being not more than equal to six of the latter. The difference, if it exist, may be owing to some peculiarity in the process, by which, perhaps, a difference of oxygenation, or of vitrification of the oxyd may be occasioned; or, according to the opinion of Dr. Fordyce, to the intermixture of a portion of tartarized antimony in the empirical preparation.

SULPHURETUM ANTIMONII PRÆCIPITATUM. Precipitated Sulphuret of Antimony. [Sulphur Antimonii Præcipitatum.]

“ Take of Water of Potash, four pounds; Water, three pounds; Prepared Sulphuret of Antimony, two pounds. Boil them in a covered iron pot, on a gentle fire, for three hours, stirring frequently with an iron spatula, and adding water as it may be necessary. Strain the hot liquor through a double linen cloth, and to this strained liquor add as much diluted sulphuric acid as may be necessary to precipitate the sulphuret, which is to be carefully washed with warm water.”

From the analysis of this compound by Thenard, it appears to be composed of 68.3 of the orange-coloured oxyd of antimony, (which consists of eighteen of oxygen, and eighty-two of antimony), 17.8 of sulphurated hydrogen, and eleven or twelve of sulphur. The theory of its formation is somewhat intricate. In boiling the sulphuret of antimony with the potash, a sulphuret of potash is formed, and this decomposing part of the water, hydro-sulphuret of potash is also produced; the antimony appears to be at the same time oxydated. This oxyd is retained in solution by the sulphuret and hydro-sulphuret of potash. When sulphuric acid is added, it unites with the potash, and the antimonial oxyd, combined with part of the sulphurated hydrogen and sulphur, is precipitated. In the foreign Pharmacopœias, an equal part of sulphur is added to the sulphuret of antimony, by which the product is increased.

When the liquor obtained by boiling the solution of potash on the sulphuret of antimony is strained, and allowed to cool, it deposits a red-coloured powder, which has been known by the name of *Kermes Mineral*, and has been much used on the Continent. From the analysis of it by Thenard, it appears to be a compound of brown oxyd of antimony and sulphurated hydrogen, with a small portion of sulphur, the last being probably accidental. Trommsdorff attributes the difference be-

tween these two preparations, to the one *essentially* containing sulphur combined with the oxyd of antimony and sulphurated hydrogen; the other not. Thenard ascribes it rather to a difference of oxygenation, the oxyd in the *kermes* being less highly oxydated than in the other.

They agree nearly in their medicinal qualities, which are similar to those of the other antimonials. They have been used principally as diaphoretics and sudorifics, but are always uncertain in their operation. The dose of the precipitated sulphuret of antimony, or, as it should rather be named, the Hydro-sulphurated Oxyd of Antimony, is five or six grains.

OXIDUM ANTIMONII CUM SULPHURE, PER NITRATUM POTASSÆ: *olim, Crocus Antimonii*. Oxyd of Antimony with Sulphur, by Nitrat of Potash. [*Crocus Antimonii*.]

“Take of Sulphuret of Antimony, Nitrat of Potash, of each equal weights. Triturate them separately, and, having mixed them well together, throw them into a crucible red hot. The deflagration being over, separate the reddish matter from the white crust, and rub it to a powder, which is to be frequently washed with warm water, until it remain insipid.”

During the deflagration, the nitric acid of the nitrat of potash is decomposed; its oxygen is attracted, partly by the sulphur, and partly by the antimony. The sulphurous acid, which is the principal product of the oxygenation of the sulphur, is in part dissipated, and in part combined with the potash, and forms the white crust which is directed to be removed. By the union of another portion of the oxygen with the antimony, a brown or reddish oxyd is formed. It appears also that part of the sulphuret of antimony escapes decomposition or oxygenation, and unites with the oxyd. The preparation, therefore, is an imperfect oxyd of antimony with sulphuret of antimony.

As an antimonial, this preparation is so uncertain in its operation, that it is never prescribed; it is used in making some of the other preparations of this metal.

MURIAS ANTIMONII. Muriat of Antimony. [Antimonium Muriatum.]

“Take of Oxyd of Antimony with Sulphur by Nitrat of Potash, Sulphuric Acid, of each one pound; Dried Muriat of Soda, two pounds. Pour the sulphuric acid into a retort, adding gradually the muriat of soda and the oxyd of antimony, previously mixed. Then distil from warm sand. Expose the distilled matter for some days to the air, that it may deliquesce; then pour the liquid part from the impurities.”

In this mode of forming muriat of antimony, the muriat of soda is decomposed by the sulphuric acid combining with the soda; the muriatic acid disengaged, unites with the oxyd of antimony, and the compound is volatilized. It is at first of a soft consistence, but soon attracts a sufficient portion of humidity to render it fluid. If water be poured on it, it is decomposed, and a sub-muriat of antimony is precipitated.

This preparation is unfit for internal use; externally it has sometimes been used as a caustic. Decomposed by potash, it affords an oxyd which has been used in preparing the tartrite of antimony.

TARTRIS ANTIMONII *olim, Ta tarus Emeticus*. Tartrite of Antimony. [Antimonium Tartarisatum]

“Take of Oxyd of Antimony with Sulphur by Nitrat of Potash, three parts; Super-Tartrite of Potash, four parts; Distilled Water, Thirty-two parts. Boil them in a glass vessel for a quarter of an hour. Strain through paper, and put aside the strained liquor, that crystals may be formed.”

The excess of tartarous acid in the super-tartrite of potash, is capable of combining with a number of the metallic oxyds, and forming ternary compounds. With oxyd of antimony, when not too highly oxydated, it unites with facility, forming a combination of this kind, which constitutes the present preparation. As the tar-

tarous acid is saturated, partly by potash, and partly by oxyd of antimony, it is not a pure tartrate of antimony, but a tartrate of antimony and potash. According to the analysis of it by Thenard, it consists of thirty-eight parts of oxyd of antimony, thirty-four of tartarous acid, sixteen of potash, and eight of water.

As this is the most important of the antimonial preparations, the processes for obtaining it have been often varied, principally in the selection of the oxyd of antimony employed. The object is to obtain an oxyd, not too expensive in its preparation, and which shall combine with facility with the tartarous acid. The oxyd precipitated by potash from muriat of antimony, recommended by Bergman, and employed in the process given in the preceding edition of the *Edinburgh Pharmacopœia*, is liable to the former objection. The oxyd which is at present ordered in the processes, both of the London and *Edinburgh Pharmacopœias*, answers sufficiently well, if it has been properly prepared. As met with in the shops, it is, however, almost always unfit for this purpose; as, from not being prepared with the due proportion of nitrat of potash, it is not sufficiently oxydated. The vitrified oxyd is, perhaps, the most unexceptionable; it contains, indeed, a portion of siliceous earth, which accompanies the oxyd of antimony in its combination with the tartarous acid, and, when the liquor is considerably evaporated, gives to it a gelatinous consistence: but, before this happens, the greater part of the tartrate of antimony and potash may be procured by crystallization; or, according to Vauquelin's method, the solution may be directly evaporated to dryness, and, on again dissolving the saline matter in water, the silex remains undissolved.

Tartrate of antimony and potash crystallizes in small triedral pyramids, which are efflorescent. Its solubility has been variously stated, and appears to vary according to the quantity of antimonial oxyd contained in it, from proper preparation. According to Dr. Saunders, one ounce of water at 60° dissolves fifty-two grains of the fully saturated salt, while of that generally met with, it dissolves from thirty-two to thirty-five. This affords

even a mode of judging of the strength of this preparation. It is very susceptible of decomposition, suffering it not only from alkalies, earths, acids, and a number of neutral salts, but even from vegetable infusions and decoctions, the vegetable matter attracting apparently part of the oxygen of the oxyd. If kept dissolved in water, it is also decomposed, from the spontaneous decomposition of the tartarous acid.

This preparation is undoubtedly superior to the other antimonials, in the certainty of its operation; and, from its solubility, is more manageable with regard to dose. Its medicinal applications have been already noticed. It is given as an emetic in a dose of from one to three grains, dissolved in water; and, in smaller doses, as an expectorant and diaphoretic.

VINUM TARTRITIS ANTIMONII: *olim, Vinum Antimoniale.* Wine of Tartrite of Antimony.

“Take of Tartrite of Antimony, twenty-four grains; White Wine, one pound. Mix, so that the tartrite of antimony may be dissolved.”

This salt, dissolved in wine, can be preserved longer without decomposition than when dissolved in water; but, even on long keeping, part of the antimonial oxyd is deposited. It is given as an emetic in the dose of one ounce; as a diaphoretic, in a much smaller dose.

VINUM ANTIMONII TARTARISATI. *Pharm. Lond.* Wine of Tartarised Antimony.

“Take of Tartarised Antimony, two scruples; Boiling Distilled Water by measure, two ounces; Spanish White Wine by measure, eight ounces. Dissolve the tartarised antimony in the boiling distilled water, and add the wine.”

It is to be regretted, that preparations so similar in name as these two wines, should differ materially in strength; this containing four grains of tartrite of antimony in the ounce, the other only two grains. The dose of this wine as an emetic, is half an ounce.

VINUM ANTIMONII. Antimonial Wine. *Pharm. Lond.*

“ Take of Vitrified Antimony, in powder, one ounce; Spanish White Wine, one pound and a half. Digest for twelve days with frequent agitation, and strain through paper.”

This is the old formula for the preparation of antimonial wine. The tartarous acid, contained in greater or less quantity in all wines, acts on the oxyd of antimony, and renders part of it soluble. But the quantity must be uncertain, and the wine cannot be uniform in strength.

ANTIMONIUM CALCINATUM. Calcined Antimony.
Pharm. Lond. White Oxyd of Antimony.

“ Take of Antimony (Sulphuret of Antimony) in powder, eight ounces; Nitre in powder, two pounds. Mix them, and throw the mixture gradually into a red hot crucible. Burn the matter remaining after the deflagration, for half an hour, and, when cold, rub it to powder; then wash it with distilled water.”

So much nitrat of potash is exposed to heat with the sulphuret of antimony, in this process, that a quantity of oxygen is afforded by its decomposition, sufficient to acidify the sulphur, and completely oxydate the metal. The perfect oxyd remains after the washing, combined with a small quantity of potash. The preparation is one of little activity; it was supposed to be diaphoretic, and was given in a dose from five to ten grains, as a substitute for James's powder; but it is now seldom employed.

CUPRUM.—COPPER.

AMMONIARETUM CUPRI: *olim, Cuprum Ammoniacum.*
Ammoniuret of Copper.

“TAKE of Pure Sulphat of Copper, two parts; Carbonat of Ammonia, three parts. Rub them thoroughly in a glass mortar, until all effervescence is finished, and they unite uniformly into a violet-coloured mass, which being wrapt in bibulous paper, is to be dried, first on a chalk stone, and afterwards with a gentle heat. It is to be kept in a glass phial well stopt.”

The sulphat of copper is decomposed by the carbonat of ammonia. One portion of ammonia combines with the sulphuric acid, another portion of it unites with the oxyd of copper, and the violet-coloured mass which is formed, is a mixture of the two resulting compounds: the carbonic acid is disengaged with effervescence. A compound somewhat similar is obtained, according to a formula inserted in several of the foreign Pharmacopœias, in which a saturated solution of sulphat of copper is decomposed by ammonia, the ammonia being added in excess, so as to redissolve the oxyd of copper; to this solution alcohol is added, by which the ammoniuret of copper is precipitated in small crystals.

The present preparation has been chiefly employed as a remedy in epilepsy. It is given in a dose of at first half a grain twice a-day, which is gradually and slowly increased to two or three grains, and continued for some time.

SOLUTIO SULPHATIS CUPRI COMPOSITA: *olim, Aqua Styptica.* Compound Solution of Sulphat of Copper.

“Take of Sulphat of Copper, Sulphat of Alum, of each three ounces; Water, two pounds; Sulphuric Acid, one ounce and a half. Boil the sulphats in water, that they may be dissolved; then to the liquor strained through paper add the acid.”

This is merely a combination of powerful astringents. It has been applied topically to check hæmorrhage, and, largely diluted with water, as a wash in purulent ophthalmia.

AQUA CUPRI AMMONIATI. Water of Ammoniated Copper. *Pharm. Lond.*

“ Take of Sal Ammoniac (Muriat of Ammonia), one drachm; Lime Water, one pound. Allow them to remain in a copper vessel until the ammonia is saturated with copper.”

In this indirect mode of combining oxyd of copper with ammonia, the lime decomposes the muriat of ammonia, by combining with the muriatic acid; the disengaged ammonia disposes the copper to oxydation from the atmospheric air, and combines with the oxyd, forming a dilute solution of ammoniureted oxyd of copper. It has been applied, diluted with an equal part of water, as a gentle escharotic, to remove specks from the cornea. A similar preparation had formerly a place in the Edinburgh Pharmacopœia, under the name of AQUA ÆRUGINIS AMMONIATA.

FERRUM.—IRON.

FERRI LIMATURA PURIFICATA. Purified Filings of Iron.

“ Having placed a sieve over the filings, apply a magnet, that they may be drawn through the sieve upwards.”

This preparation has been already noticed, (page 230).

CARBONAS FERRI: *olim, Ferri Rubigo*. Carbonat of Iron. [Rubigo Ferri.]

“ Let Purified Filings of Iron be frequently moistened with water, that they may fall into a rust, which is to be rubbed to a fine powder.”

This process for preparing a carbonat of iron has been likewise already taken notice of (p. 230.)

CARBONAS FERRI PRÆCIPITATUS. Precipitated Carbonat of Iron.

“Take of Sulphat of Iron, four ounces; Carbonat of Soda, five ounces; Water, ten pounds. Dissolve the sulphat of iron in the water; then add the carbonat of soda, previously dissolved in as much water as may be necessary, and mix them well. Let the carbonat of iron, which is precipitated, be washed with warm water, and afterwards dried.”

On mixing the solutions of carbonat of soda and sulphat of iron, the soda attracts the sulphuric acid, the carbonic acid combines with the oxyd of iron; the sulphat of soda remains in solution; the carbonat of iron is precipitated. The green sulphat of iron, which is that employed, contains the metal at its *minimum* of oxydation, and this imperfect oxyd combines with the carbonic acid; but it quickly attracts more oxygen from the atmospheric air, and the precipitate of carbonat of iron, in drying, changes its colour, from this cause, from a dark green to a reddish brown.

Carbonat of iron is a mild, and not inactive preparation. It is given as a tonic in a dose of five or ten grains. The formula of Dr. Griffiths, which has been highly celebrated as a chalybeate, is an extemporaneous preparation of this kind.

FERRI OXIDUM NIGRUM PURIFICATUM: *olim, Ferri Squamæ Purificatæ*. Purified Black Oxyd of Iron.

“Let the scales of iron, gathered at the anvils of the workmen, be purified, by applying a magnet. The magnet attracts only the smaller and purer scales, leaving the larger and less pure.”

This, it has been already observed (p. 231), is used only in making some of the other preparations of iron.

SULPHAS FERRI: Sulphat of Iron. [Ferrum Vitriolatum.]

“ Take of Purified Filings of Iron, six ounces; Sulphuric Acid, eight ounces; Water, two pounds and a half. Mix them; and the effervescence being over, digest for a short time in a sand-bath; then strain the liquor through paper, and, after due evaporation, put it aside that crystals may form.”

The sulphuric acid, by a disposing affinity, enables the iron to attract the oxygen of the water with rapidity, and unites with the oxyd thus formed. This oxyd is at the *minimum* of oxydation, and the salt which it forms is named the Green Sulphat of Iron, to distinguish it from the Red Sulphat, in which the metal is more highly oxydated. This Green Sulphat is prepared for the various purposes to which it is applied in the arts, on a large scale, by exposing the native sulphuret of iron to air and moisture; but, by the present process, it is obtained in a purer state.

Sulphat of iron is one of the most active preparations of the metal. Its medium dose is from three to five grains.

SULPHAS FERRI EXSICCATUS. Dried Sulphat of Iron.

“ Take of the Sulphat of Iron, any quantity. Heat it in an unglazed earthen vessel, on a gentle fire, until it become white and perfectly dry.”

This is merely the sulphat of iron freed from its water of crystallization. It was never medicinally employed, and has a place in the Pharmacopœia only from being used in one or two pharmaceutical preparations.

OXIDUM FERRI RUBRUM. Red Oxyd of Iron.

“ Let Dried Sulphat of Iron be exposed to a violent heat, until it is converted into a red coloured matter.”

By an intense heat, sulphat of iron is decomposed; its

acid is partly expelled, and in part suffers decomposition. The red oxyd is the residuum. It is scarcely medically employed, but is used in some pharmaceutical preparations.

TINCTURA MURIATIS FERRI. Tincture of Muriat of Iron. [Tinctura Ferri Muriati.]

“ Take of the Purified Black Oxyd of Iron, in powder, three ounces; Muriatic Acid, about ten ounces, or as much as may be sufficient to dissolve the powder. Digest with a gentle heat, and, when the powder is dissolved, add as much alkohol as that there shall be of the whole liquor two pounds and a half.”

The black oxyd of iron combines with the muriatic acid, and, during the solution, acquires more oxygen, partly by absorption from the atmosphere, and partly by decomposition of the water, which is promoted by the heat applied. The muriat of iron, in which this more perfect oxyd is contained, is soluble in alkohol. The present preparation is such a tincture, diluted with the water of the muriatic acid. When first prepared, it contains a portion of muriat of iron, in which the metal is imperfectly oxydated; but this soon attracts more oxygen, and hence the colour of the tincture deepens on keeping.

It is a very active preparation, and is given in the diseases in which iron is employed, in a dose of ten or fifteen drops.

MURIAS AMMONIÆ ET FERRI: *olim, Flores Martiales.*
Muriat of Ammonia and Iron. [Ferrum Ammoniacale.]

“ Take of Red Oxyd of Iron, washed and again dried, Muriat of Ammonia, of each equal weights. Mix them well together, and sublime.”

Oxyd of iron decomposes muriat of ammonia, by attracting the muriatic acid, and, in the present process, this decomposition takes place. But, from the propor-

tions of the substances employed, part of the muriat of ammonia escapes decomposition; it is sublimed by the heat applied, and elevates along with it part of the muriat of iron that had been formed. The process is therefore rather an unscientific mode of obtaining a muriat of iron: the preparation too has been found uncertain in strength, more or less of the muriat of iron being sublimed, according to the heat applied; and, accordingly, it has now fallen into disuse. It was principally employed as a remedy in rickets, in the dose, to children, of two or three grains.

TINCTURA FERRI AMMONIACALIS. *Pharm. Lond.*

“Take of Ammoniacal Iron, four ounces; Proof Spirit, by measure, one pound. Digest and strain.”

This is an unnecessary preparation, as it differs little from the Tincture of Muriated Iron.

FERRUM TARTARISATUM. Tartarised Iron. *Pharm. Lond.*

“Take of Filings of Iron, one pound; Crystals of Tartar (Super-Tartrate of Potash), powdered, two pounds; Distilled Water, one pound. Mix them, and expose the mixture to the air in an open glass vessel for eight days; then rub the matter, dried by a sand-bath, into a very fine powder.”

By exposure to air and moisture, the iron is oxydated, and its oxyd combines with the excess of acid in the super-tartrate of potash, a triple salt resulting, composed of potash, oxyd of iron, and tartarous acid. It is very soluble in water. As a medicine, it is milder in its operation than some of the other saline preparations of the metal. Its dose is from five to fifteen grains.

VINUM FERRI. Wine of Iron. *Pharm. Lond.*

“Take of filings of Iron, four ounces; Spanish White Wine, four pounds. Digest with frequent agitation for a month, and strain.”

This is a similar preparation; the tartarous acid present in the wine oxydating and combining with the iron: it must always, however, be uncertain in strength. Its usual dose is one or two drachms.

HYDRARGYRUS.—QUICKSILVER.

HYDRARGYRUS PURIFICATUS. Purified Quicksilver.
[Hydrargyrus Purificat.]

“Take of Quicksilver, four parts; Iron Filings, one part. Rub them together and distil from an iron vessel.”

Quicksilver is sometimes adulterated with other metals. To obtain it perfectly pure is the design of this process. The addition of the iron filings renders the distilled quicksilver more bright and mobile; an effect not perfectly explained, but ascribed to the iron retaining combined with it any foreign metal, or any portion of carbon that might have been contained in the quicksilver.

ACETIS HYDRARGYRI. Acetite of Quicksilver. [Hydrargyrus Acetatus.]

“Take of Purified Quicksilver, three ounces; Diluted Nitrous Acid, four ounces and a half, or a little more than may be requisite to dissolve the quicksilver; Acetite of Potash, three ounces; Boiling Water, eight pounds. Mix the quicksilver with the diluted nitrous acid; and towards the end of the effervescence, digest, if necessary, with a gentle heat, until the quicksilver be entirely dissolved. Then dissolve the acetite of potash in the boiling water, and immediately on this solution, while hot, pour the other, and mix them both by agitation. Then put aside, that crystals may be formed. These being placed in a funnel, wash them with cold distilled water; and, lastly, dry them with a very gentle heat.

“ In preparing the acetite of quicksilver, it is necessary that all the vessels and the funnel which are employed should be of glass.”

Acetite of Mercury is, in some of the foreign Pharmacopœias, formed by digesting the red oxyd, or rather sub-nitrat of mercury, in distilled vinegar; but, in the process adopted by the Edinburgh and London Colleges, it is obtained by the exertion of a double elective attraction. On mixing the solutions of nitrat of mercury and acetite of potash, the oxyd of mercury attracts the acetic acid, and the potash combines with the nitric acid. The acetite of mercury crystallizes as the liquor cools. The observations of Proust seem just, that by these two processes different acetites of mercury are obtained; by the former, one in which the oxyd is at the *maximum* of oxydation, and, by the other, one at the *minimum*. It is this latter only which forms the soft flaky substance that has been usually employed in medicine. It may be doubted whether the use of so large a proportion of acid, and the application of heat, ordered in the process of the Pharmacopœia, be proper; the process in the former edition seems indeed preferable to that which is now adopted.

Acetite of mercury crystallizes in small brilliant flakes. It is soluble in hot, and insoluble in cold water. As an antisyphilitic remedy, it is very mild in its operation; but its effects are not considered as sufficiently permanent to allow of it being relied on in effecting a radical cure. Its dose is a grain, night and morning.

MURIAS HYDRARGYRI: *olim, Mercurius Sublimatus Corrosivus*. Muriat of Mercury. [Hydrargyrus Muriatus.]

“ Take of Purified Quicksilver, two pounds; Sulphuric Acid, two pounds and a half; Muriat of Soda, dried, four pounds. Boil the quicksilver with the sulphuric acid in a glass vessel placed in a sand-bath, until the matter become dry. Mix the cold matter in a glass vessel, with the muriat of soda; then sublime it in a glass

cucurbit with a heat gradually raised. Separate the sublimed matter from the scorïæ."

In the first stage of this process, the sulphuric acid oxydates the mercury, and combines with the oxyd; and, by the heat applied, the salt thus formed is that which contains the metal in a high state of oxydation. This salt, in its dry state, is mixed with muriat of soda, and, by the application of heat, a double decomposition is effected; the soda attracts the sulphuric acid, and the muriatic acid combines with the oxyd of mercury. The muriat of mercury being easily volatilized, is separated from the sulphat of soda by sublimation. The process formerly used, was, to mix sub-nitrat of mercury, muriat of soda, and dried sulphat of iron, and expose the mixture to a heat sufficient to sublime the muriat of mercury: And there is some reason to doubt, notwithstanding the expence of the nitrous acid in this process, whether it is not more economical, or whether it does not more certainly afford the whole mercury in the form of corrosive muriat, than the one now adopted.

According to the analysis of muriat of mercury by Mr. Chenevix, it consists of eighty-two of oxyd of mercury (this oxyd being composed of eighty-five of mercury and fifteen of oxygen), and eighteen of muriatic acid; or, its ultimate constituents are, quicksilver, 69.7, oxygen, 12.3, and muriatic acid, 18. By slow sublimation, it is obtained crystallized in slender prisms; by a more hasty sublimation, in a compact crystalline mass. It is easily soluble in water, requiring twenty parts at 60° for its solution, and two parts at 212°. It is likewise soluble in alcohol. Its taste is acrid and metallic. It turns to a green several vegetable colours; is decomposed by the alkalies and earths, and by a number of compound salts, and likewise by vegetable infusions.

It is the most powerful of the mercurial preparations. Its dose cannot safely exceed the fourth of a grain, nor can more than one grain be given in twenty-four hours. As an antisyphilitic remedy it has long been established in practice, and it possesses some advantages. It acts speedily, and its action is more general on the system,

or less determined to particular parts; but these are more than counterbalanced by the occasional violence of its operation, and by the circumstance which seems now admitted, that it cannot be so much relied on in establishing a permanent cure. It is given in the form of solution in water or alkohol, the dose being increased from the sixth to the fourth of a grain, night and morning, and mucilaginous diluents being freely taken, with the occasional use of opium. As the solution has a very disagreeable taste, it is sometimes made into pills with crumb of bread. In other diseases besides lues venerea, it is occasionally exhibited, particularly in cutaneous affections. Externally, its solution is employed as an escharotic in chancre and venereal ulcers of the mouth; and a very dilute solution of it has been used as an injection, to excite inflammation in obstinate gleet.

SUB-MURIAS HYDRARGYRI: *olim, Calomelas.* Sub-Muriat of Quicksilver. [Calomelas.]

“Take of Muriat of Quicksilver, rubbed to powder in a glass mortar, four ounces; Purified Quicksilver, three ounces. Rub them together in a glass mortar, with a little water, that the operator may be guarded against the acrid powder which would otherwise arise, until the quicksilver is extinguished. Put the dried powder into an oblong phial, of which it shall fill only one-third, and let it be sublimed in a sand-bath. The sublimation being finished, and the phial broken, the red powder at the bottom and the white one about the neck of it are equally to be rejected; the remaining mass is to be again sublimed, and rubbed into a fine powder, which is lastly to be washed with boiling distilled water.”

In this process, the directions for performing of which are sufficiently explicit, an additional quantity of quicksilver is brought into chemical union with the constituent principles of muriat of mercury. In *that* compound, the metal is highly oxydated, and the oxyd is combined with a considerable proportion of muriatic acid. In converting it into the Sub-Muriat of Mercury, as it is

named, the portion of metal which is added attracts part of the oxygen of the oxyd, and the whole becomes an oxyd of mercury with a comparatively small proportion of oxygen; and this oxyd requiring less muriatic acid for its saturation than the one more highly oxydated does, finds a sufficient quantity in the pre-existing muriat. The one is merely imperfect oxyd of mercury combined with muriatic acid; the other perfect oxyd of mercury united with the same acid, the latter at the same time containing more acid in its composition than the former. Mr. Chenevix's analysis has fixed the proportions with accuracy. Those of the Muriat, as it has been named, have been already stated; those of the Sub-Muriat are, muriatic acid, 11.5, oxyd of mercury, 88.5, (this oxyd being composed of quicksilver, 89.3, and oxygen 16.7.). So that the ultimate constituent parts of Sub-Muriat of Mercury, are, quicksilver, 79, oxygen, 9.5, muriatic acid, 11.5.

The names which have been chosen to distinguish these two muriats of mercury, are not the best that might have been selected. In a chemical point of view, the prefixing the syllable *sub*, to denote the one, is incorrect, since the use of that syllable is restricted to those salts in which the base is the same, but where there is a deficiency of acid; and in the muriat to which it is here applied, the base is not the same, and there is no such deficiency of acid, the metallic oxyd being saturated, or combined with as much as it is disposed to unite with. As a medical nomenclature, the adoption of it is still more to be regretted, as the merely prefixing the syllable to the same name is insufficient to guard effectually against the dangerous mistake of confounding preparations which differ so widely in their powers. The epithets *corrosive* and *mild* have long been used to discriminate them; they do so more clearly, and, as systematic names, they are preferable, as according with the established nomenclature of the metallic salts, which draws the distinctions between the salts formed from different oxyds of the same metal united with one acid, from some quality in which they differ. The one prepa-

ration ought to have been named *Murias Hydrargyri Corrosivus*, the other *Murias Hydrargyri Mitis*.

This preparation of mercury differs from the former, in being perfectly insipid, and insoluble in water or alcohol. By sublimation it may be obtained in small short prisms, but it is usually in the form of a mass somewhat ductile, semi-transparent and very heavy. It is decomposed by the alkalies, earths, and various compound salts.

Sub-muriat, or mild muriat of mercury, is one of the most useful preparations of the metal. As an anti-venereal it is given in the dose of a grain night and morning, its usual determination to the intestines being prevented, if necessary, by opium. It is the preparation which is, perhaps, most usually given in the other diseases in which mercury is employed, as in affections of the liver or neighbouring organs, in cutaneous diseases, chronic rheumatism, tetanus, hydrophobia, hydrocephalus, and febrile affections especially those of warm climates. It is employed as a cathartic alone, or to promote the operation of other purgatives. Its anthelmintic power is justly celebrated; and it is perhaps superior to the other mercurials, in assisting the operation of diuretics in dropsy. From its great specific gravity, it ought always to be given in the form of bolus or pill.

SUB-MURIAS HYDRARGYRI PRÆCIPITATUS. Precipitated Sub-muriat of Mercury. [*Hydrargyrus Muriatus Mitis*.]

“Take of Diluted Nitrous Acid, Purified Quicksilver, of each eight ounces; Muriat of Soda, four ounces and a half; Boiling Water, eight pounds. Mix the quicksilver with the diluted nitrous acid; and, towards the end of the effervescence, digest with a gentle heat, shaking the vessel frequently. It is necessary, however, that more quicksilver should be mixed with the acid than this can dissolve, that the solution may be obtained fully saturated. Dissolve at the same time the muriat of soda in the boiling water: pour the other solution on this while warm, and mix them quickly together. After the precipitate

subsides, pour off the saline liquor, and wash the sub-muriat of mercury, by frequently adding warm water, pouring it off after each time the precipitate subsides, until it come off tasteless."

Mild Muriat of Mercury is in this process obtained by a double elective attraction. On mixing together the solutions of nitrat of mercury and muriat of soda, the nitric acid is attracted by the soda, and the muriatic acid by the oxyd of mercury. In order that the mild, and not the corrosive muriat should be formed, it is evident that the mercury in the nitrous acid should be in its least oxydated state. In the original process of Scheele, by whom this mode of preparing mild muriat of mercury was proposed, the nitrous acid was directed to be boiled or digested on the mercury, with the view of saturating it more fully with the metal. This direction has been retained in the different Pharmacopœias in which the process has been adopted; and even lately, Mr. Chenevix seems to incline to the opinion on which it is founded,—that, by adding a large proportion of mercury to nitrous acid, and promoting the solution by heat, the combination is obtained in which the metal is imperfectly oxydated. It will be found, however, on experiment, that this is not the case. When the solution is made slowly and in the cold, on adding it to muriat of soda, much more mild, and less corrosive, muriat of mercury is formed, than when the usual directions are complied with. We thus also avoid the precipitation of sub-nitrat of mercury, which takes place on mixing the two solutions, when heat has been applied in preparing the mercurial solution. It is always necessary, however, to wash the precipitate carefully, as a small portion of corrosive muriat is formed, even when the process is most properly conducted.

Mild muriat of mercury, prepared in this mode, is precisely the same in its chemical composition as when formed by the former process of sublimation. It has been supposed, however, that it differs somewhat in its operation, and that in particular it is more liable to produce purging. If such a difference ever exist, it is probably owing to the presence of the sub-nitrat of mercury, which,

when the usual directions are observed, may be mixed with the mild muriat. If the latter is pure, its operation must be the same as that of the muriat prepared by sublimation, as it differs from it only in being in a much finer powder than what the other can be reduced to, and this has been supposed to give it some superiority.

OXIDUM HYDRARGYRI CINEREUM. Ash-Coloured
Oxyd of Quicksilver.

“Take of Purified Quicksilver, four parts; Diluted Nitrous Acid, five parts; Distilled Water, fifteen parts; Water of Carbonat of Ammonia, as much as may be sufficient. Dissolve the quicksilver in the acid. Add gradually the distilled water. Then pour on as much of the water of carbonat of ammonia as may be sufficient to precipitate the oxyd of quicksilver, which is to be afterwards washed with pure water and dried.”

In this process the nitric acid oxydates the mercury, and combines with the oxyd. The action of ammonia on the nitrat of mercury is peculiar: it does not merely decompose it by combining with the acid, and separating the oxyd, but it exerts a farther action on the oxyd, partially deoxydating it, by part of its hydrogen attracting a part of the oxygen. The oxyd precipitated, therefore, is that in which the metal is combined with the least proportion of oxygen.

In order, however, that this may be the nature of the precipitate, it is necessary that the solution of the mercury in the nitric acid should have been made in the cold, and with a diluted acid. When, from these circumstances not having been attended to, the mercury has been too highly oxydated, ammonia throws down from the solution a white precipitate; and the present preparation is often met with of a light gray colour, from the intermixture of this precipitate with the dark-coloured oxyd. When properly prepared, it is of a dark blue colour.

Ash-coloured oxyd of mercury is very similar in its operation to the preparations in which quicksilver is oxydated by trituration. It is given as an anti-venereal in the dose of one grain night and morning, generally in the form of pill.

OXIDUM HYDRARGYRI RUBRUM PER ACIDUM NITRICUM: *olim, Mercurius Præcipitatus Ruber*. Red Oxyd of Quicksilver by Nitric Acid. [Hydrargyrus Nitratus Ruber.]

“ Take of Purified Quicksilver, one pound; Diluted Nitrous Acid, sixteen ounces. Let the quicksilver be dissolved. Evaporate the solution with a gentle fire to a white dry mass, which being reduced to powder, is to be put into a glass cucurbit, a thick glass plate being put over its surface. Then a capital being adapted, and the vessel placed in sand, apply to it a fire gradually raised, until it pass into very red small scales.”

The quicksilver is in this preparation first oxydated by the nitrous acid, and then combined with a portion of it. By the increase of heat, this nitrat is decomposed, and the greater part of the acid expelled: it is doubtful, however, if it be ever wholly expelled, so as to leave a pure oxyd, the preparation being different in appearance from the red oxyd obtained by heat, and being always much more acrid. It is too much so for internal use. It is principally used externally as an escharotic.

SUB-SULPHAS HYDRARGYRI FLAVUS: *olim, Turpethum Minerale*. Yellow Sub-Sulphat of Quicksilver. [Hydrargyrus Vitriolatus.]

“ Take of Purified Quicksilver, four ounces; Sulphuric Acid, six ounces. Put them into a glass cucurbit, and boil in a sand-bath to dryness. The white matter remaining at the bottom of the vessel being powdered, is to be thrown into boiling water. It will thus be converted into a yellow powder, which must be frequently washed with warm water.”

The quicksilver is first oxydated by the sulphuric acid, and afterwards combined with it, forming super-sulphat of mercury. By the continuance of the heat, this is partially decomposed, and a sub-sulphat of mercury remains. On this, boiling water is poured; a portion of

sulphat of mercury still present in the saline matter is dissolved; and the yellow powder which remains is an oxyd of mercury, with a small quantity of sulphuric acid combined with it.

As a medicine, it is too violent in its operation to be administered internally. Sometimes, however, it has been given as a powerful emetic, in a dose of five grains, particularly in cases of swelled testicle. This practice is probably now relinquished. It is a violent errhine, and has been employed as such mixed with any mild vegetable powder.

SULPHURETUM HYDRARGYRI NIGRUM: *olim, Æthiops Mineralis*. Black Sulphuret of Quicksilver. [Hydrargyrus cum Sulphure.]

“ Take of Purified Quicksilver, Sublimed Sulphur, of each equal weights. Rub them together in a glass mortar with a glass pestle, until the globules of quicksilver entirely disappear.”

By this trituration a chemical combination appears to be effected between the quicksilver and sulphur, and perhaps the metal is at the same time imperfectly oxydated. It is in the form of a very black powder.

It is the most inactive, perhaps, of the mercurial preparations. As an anthelmintic it is sometimes given in a dose of five or ten grains, according to the age.

SOME additional preparations of mercury have a place in the London Pharmacopœia, and are used in practice.

HYDRARGYRUS SULPHURATUS RUBER. Red Sulphurated Quicksilver.

“ Take of Purified Quicksilver, forty ounces; sulphur, eight ounces. Mix the quicksilver with the melted sulphur. If the mixture inflame, extinguish it by covering the vessel; then reduce it to powder and sublime.”

In this preparation it was conceived, that, during the inflammation of the materials, the quicksilver was oxydated, and that therefore the resulting compound was a combination of sulphur and oxyd of mercury. The extrication of heat and light, which arises from the mutual action of the ingredients, appears however not be an example of oxygenation, but to be rather of the same kind as that which takes place from the combination of different metals with sulphur; and, according to the analysis of Proust, Cinnabar, as this preparation is named, consists of sulphur with metallic mercury, in the proportion of fifteen of the former to eighty-five of the latter.

Red sulphurated quicksilver is used medicinally, principally under the form of fumigation, to check the progress of venereal ulcers.

HYDRARGYRUS CUM CRETA. Quicksilver with Chalk.

“Take of Purified Quicksilver, three ounces; Prepared Chalk, five ounces. Rub them together until the globules disappear.”

In this, as in other cases of the trituration of mercury, it suffers oxydation more or less completely; and on the quantity of oxyd formed, must depend the activity of the preparation. It is very little employed.

HYDRARGYRUS CALCINATUS. Calcined Quicksilver. *Red Oxyd of Quicksilver.*

“Take of Purified Quicksilver, one pound. Expose the quicksilver in a glass cucurbit having a flat bottom, in a sand-bath to a heat of 600°, until it concretes into a red powder.”

This operation of oxydating quicksilver, by atmospheric air, with the assistance of heat, is troublesome and expensive, owing to the quicksilver being volatilized at nearly the same temperature as that at which it is capable of attracting oxygen. The red oxyd is in the form of scales; it is decomposed by the heat of ignition, giving out very pure oxygen gas. It contains seven parts of oxygen in the 100.

The high price of this preparation prevents it from being employed in common practice. It has been regarded as one of the most active of the mercurials, and, at the same time, one of the most permanent in its effects, and has been recommended in confirmed *lues*, where other preparations have failed. Its dose is half a grain or a grain.

CALX HYDRARGYRI ALBA. White Calx of Quicksilver.

“Take of Muriated Quicksilver, Sal-Ammoniac (Muriat of Ammonia), Water of Prepared Kali, of each half a pound. Dissolve first the sal-ammoniac, and then the muriated quicksilver, in distilled water, to which add the water of prepared kali. Wash the powder until it is tasteless.”

The theory of this process is somewhat complicated. The potash decomposes the muriat of ammonia, by combining with the muriatic acid, and the disengaged ammonia decomposes the muriat of mercury. Hence, if to a solution of corrosive muriat of mercury, ammonia be added, the same preparation is obtained as by this process. The action of the ammonia in decomposing the corrosive muriat of mercury is also somewhat peculiar. It does not merely attract the muriatic acid, and separate the pure mercurial oxyd, but this oxyd retains combined with it a portion both of the ammonia and acid. It is therefore a triple compound, consisting, according to Fourcroy's analysis of it by decomposing it by heat, of eighty-one parts of oxyd of mercury, sixteen of muriatic acid, and three of ammonia. This preparation, *Murias Hydrargyri et Ammoniaë*, formerly known by the name of *White Precipitate of Mercury*, is used only externally in the form of ointment, as an application in some cutaneous affections.

PLUMBUM.—LEAD.

ACETIS PLUMBI: *olim, Saccharum Saturni.* Acetite of Lead. [Cerussa Acetata.]

“Take of White Oxyd of Lead, any quantity. Put it into a cucurbit, and pour upon it twice its weight of distilled Acetous Acid. Let the mixture stand on warm sand until the acid become sweet; then pour it off, and add a fresh quantity as often as may be necessary, until it cease to acquire sweetness. Then evaporate the whole liquor, freed from impurities, in a glass vessel, to the consistence of thin honey, and put it aside in a cool place, that crystals may concrete, which are to be dried in the shade. Evaporate the remaining liquor, that there may be a new formation of crystals, and repeat this evaporation until no more are formed.”

The oxyd of lead is in this preparation combined with acetous acid; the salt formed concretes in acicular crystals. The process is generally carried on on a large scale, to furnish it for various purposes in the arts.

The medicinal uses of acetite of lead have been already noticed. It is principally employed externally as an astringent,—as a collyrium in ophthalmia; an injection in gonorrhœa; and a wash in superficial inflammation.

AQUA LITHARGYRI ACETATI. Water of Acetated Litharge. *Pharm. Lond.*

“Take of Litharge, two pounds and four ounces; Distilled Vinegar, one gallon. Mix them and boil to six pounds, stirring constantly; then put aside the liquor. After the impurities have subsided, strain it.”

This preparation has been long in use under the name of *Goulard's Extract of Lead*. It is merely a solution of acetite of lead in water with an excess of acid, and must be always variable in strength. It is applied to the same purposes as the acetite of lead.

ZINCUM.—ZINC.

OXIDUM ZINCI. Oxyd of Zinc.

“LET a large crucible be placed in a furnace filled with burning fuel, in such a manner that it shall be somewhat inclined to its mouth; and, when the bottom of the crucible is at a moderate red heat, throw in pieces of Zinc, about the weight, each of them, of one drachm. The zinc soon inflames, and is converted into white flocculi, which are to be removed, from time to time, from the surface of the metal, with an iron spatula, that the combustion may proceed more perfectly; and, when the inflammation ceases, remove the oxyd of zinc from the crucible. Another piece of zinc being thrown in, the operation is to be renewed and repeated as often as may be necessary. Lastly, let the oxyd of zinc be prepared in the same manner as carbonat of lime.”

Zinc is the most inflammable of the metals. At the temperature of ignition, it attracts the oxygen of the atmospheric air, and burns vividly. The product is a white oxyd, insipid, insoluble, and infusible. In medicine it is employed principally as an antispasmodic in epilepsy and chorea. Its dose is from two to five grains twice a-day, and gradually increased.

SULPHAS ZINCI: *olim, Vitriolum Album.* Sulphat of Zinc.

“Take of Zinc, cut into small picces, three ounces; Sulphuric Acid, five ounces; Water, twenty ounces. Mix them, and the effervescence being finished, digest for some time on warm sand. Then strain the liquor through paper; and, after due exhalation, put it aside, that crystals may be formed.”

The sulphuric acid, by a disposing affinity, enables the zinc to oxydate itself by decomposing the water, and then combines with this oxyd. The salt is obtained

in acicular crystals. The process, however, is scarcely ever performed in the shops, the sulphat of zinc being prepared on a large scale, from certain varieties of the native sulphuret of the metal. As the crystallization of it is difficult, it is always in the form of hard white masses. This salt is ordered to be purified, in the London Pharmacopœia, by dissolving it in water, adding a small portion of sulphuric acid, and crystallizing.

Sulphat of zinc is used principally as an astringent, in the form of solution,—as an injection in gonorrhœa, and a collyrium in ophthalmia.

SOLUTIO SULPHATIS ZINCI. Solution of Sulphat of Zinc.

“Take of Sulphat of Zinc, sixteen grains; Water, eight ounces; Diluted Sulphuric Acid, sixteen drops. Dissolve the sulphat of zinc in water; then the acid being added, strain through paper.”

This solution is principally used as a collyrium in ophthalmia.

AQUA ZINCI VITRIOLATI CUM CAMPHORA. Water of Vitriolated Zinc with Camphor. *Pharm. Lond.*

“Take of Vitriolated Zinc, half an ounce; Camphorated Spirit, half an ounce by measure; Boiling Water, by measure, two pounds. Mix them, and strain through paper.”

This also is used as a local application in ophthalmia. It requires, in general, to be diluted with water.

SOLUTIO ACETITIS ZINCI. Solution of Acetite of Zinc.

“Take of Sulphat of Zinc, one drachm; Distilled Water, ten ounces. Dissolve it. Take also of Acetite of Lead, four scruples; Distilled Water, ten ounces. Dissolve it. Mix the solutions. Let the liquor remain at rest a little; then strain it.”

The sulphuric acid of the sulphat of zinc is attracted by the oxyd of lead, the acetous acid of the acetite of lead by the oxyd of zinc: the sulphat of lead being insoluble, is precipitated; the acetite of zinc remains in solution. This solution is used as an injection in gonorrhœa; it is considered as more astringent than the acetite of lead, and less irritating than the sulphat of zinc.

CHAPTER XXI.

PULVERES.—POWDERS.

THIS is the simplest form of composition of medicines, the different articles being merely reduced to powder, and mixed together. It is adapted to the exhibition of such remedies as are not ungrateful, and such as are not liable to lose their virtues by keeping. The powder, when it is to be taken, is mixed with any convenient vehicle.

PULVIS AROMATICUS. Aromatic Powder. [*Pulv. Aromatic.*]

“Take of Bark of Cinnamon, Smaller Cardamom Seeds, Ginger Root, of each equal parts. Rub them into a very fine powder, which is to be kept in a glass phial well stopt.” In the London Pharmacopœia the proportion of cinnamon is larger, and one part of long pepper is likewise added.

This combination of aromatics is designed merely to add to other compositions, to communicate fragrance and pungency.

PULVIS ASARI EUROPÆI COMPOSITUS. Compound Powder of Asarabacca. [Pulv. Asari Compos.]

“Take of the Leaves of Asarabacca, three parts; the Leaves of Marjoram, Flowers of Lavender, of each one part. Rub them together to a powder.”

This is used as a mild errhine, and, when snuffed in the quantity of a few grains, occasions sneezing and a discharge of mucus.

PULVIS CARBONATIS CALCIS COMPOSITUS: *olim, Pulvis Cretaceus.*

“Take of Prepared Carbonat of Lime, four ounces; Bark of Cinnamon, one drachm and a half; nutmeg, half a drachm. Rub them together to powder.”

PULVIS CRETÆ COMPOSITUS. Compound Powder of Chalk. *Pharm. Lond.*

“Take of Prepared Chalk, half a pound; Bark of Cinnamon, four ounces; Tormentil, Gum-Arabic, of each three ounces; Long Pepper, half an ounce. Reduce them separately to powder, and mix them.”

These powders are designed as antacids, and are used principally in diarrhœa. The addition of the tormentil in the powder of the London Pharmacopœia must render it more astringent than the other. The dose of either is from a scruple to a drachm.

PULVIS CRETÆ COMPOSITUS CUM OPIO. Compound Powder of Chalk with Opium. *Pharm. Lond.*

“Take of Compound Powder of Chalk, eight ounces; Hard Purified Opium, rubbed to powder, one drachm and a half. Mix them.”

The addition of opium to astringents and antacids when given in diarrhœa, is a common practice, and this formula affords a convenient composition of this kind.

Its dose is one scruple, or half a drachm. Two scruples contain very nearly one grain of opium.

PULVIS CHELARUM CANCRI COMPOSITUS. Compound Powder of Crabs Claws. *Pharm. Lond.*

“ Take of Prepared Crabs Claws, one pound; Prepared Chalk, Prepared Red Coral, of each three ounces. Mix them.”

These different articles being merely carbonats of lime, more or less pure, the mixing of them together must be entirely superfluous.

PULVIS JALAPÆ COMPOSITUS. Compound Powder of Jalap.

“ Take of the Powder of the Root of Jalap, one part; Super-Tartrite of Potash, two parts. Rub them together into a very fine powder.”

By this addition of the acidulous tartrite of potash to jalap, the operation of the latter is supposed to be rendered less irritating and more refrigerant. It is an excellent cathartic, operating freely, in a dose of a drachm and a half.

PULVIS IPECACUANHÆ ET OPII: *olim, Pulvis Doveri.*
Powder of Ipecacuanha and Opium. [Pulvis Ipecacuanhæ Comp.]

“ Take of the Powder of the Root of Ipecacuanha, Opium, of each one part; Sulphat of Potash, eight parts. Rub them together into a fine powder.”

In this composition we have an example of the power which one medicine has of modifying the action of another, the ipecacuan rendering the operation of the opium, as a sudorific, much more certain than it otherwise would be, and appearing also to diminish its narcotic effect. This powder is the most certain sudorific we possess, and as such is established in practice. The medium dose is fifteen grains; the operation of which is to be as-

sisted by the sweating regimen; and frequently it is necessary to give additional smaller doses at intervals, to produce sweat. Its principal use is in rheumatism.

PULVIS OPIATUS. Opiate Powder.

“Take of Opium, one part; Prepared Carbonat of Lime, nine parts. Rub them together to a fine powder.”

PULVIS OPIATUS. Opiate Powder. *Pharm. Lond.*

“Take of hard Purified Opium, rubbed to powder, one drachm; Prepared Burnt Hartshorn, nine drachms. Mix them.”

In these powders the opium is merely divided by the substance mixed with it. Ten grains contain one grain of opium.

PULVIS SCAMMONII COMPOSITUS. Compound Powder of Scammony.

“Take of Scammony, Super-Tartrite of Potash, of each equal parts. Rub them together into a very fine powder.”

In this powder the operation of the scammony is supposed to be rendered milder as a purgative, by the super-tartrite of potash. It is also preferred to the scammony alone, as a hydragogue cathartic. Its dose is from ten to twenty grains.

PULVIS SCAMMONII COMPOSITUS. Compound Powder of Scammony. *Pharm. Lond.*

“Take of Scammony, Extract of Jalap, of each two ounces; Ginger, half an ounce. Rub them separately to powder, and mix them.”

This composition, though under the same name as the preceding, is of a very different nature; the stimulating operation of the scammony not being corrected, but

rather increased by the extract of jalap, and the ginger. It is a strong cathartic. Its medium dose is ten grains.

PULVIS SCAMMONII COMPOSITUS CUM ALOE. Compound Powder of Scammony with Aloes. *Pharm. Lond.*

“Take of Scammony, six drachms; Extract of Jalap, Socotorine Aloes, of each one ounce and a half; Ginger, half an ounce. Rub them separately to powder, and mix them.”

The addition of the aloes, in this formula, cannot alter very materially the operation of the other ingredients. As a stimulating cathartic, it may be given in a dose from ten to fifteen grains.

PULVIS SCAMMONII CUM CALOMELANE. Powder of Scammony with Calomel. *Pharm. Lond.*

“Take of Scammony, half an ounce; Calomel, Refined Sugar, of each two drachms. Rub them separately to powder, and mix them.”

This combination is used, both as a cathartic and anthelmintic. Its dose is from ten grains to one scruple.

PULVIS SULPHATIS ALUMINÆ COMPOSITUS: *olim; Pulvis Stypticus*. Compound Powder of Sulphat of Argil.

“Take of Sulphat of Argil, four parts, Kino, one part. Rub them into a fine powder.”

This has been sometimes used internally in menorrhagia, in repeated doses of ten or fifteen grains, and externally as a styptic application to bleeding wounds.

PULVIS ALOES CUM CANELLA. Powder of Aloes with Canella. *Pharm. Lond.*

“Take of Socotorine Aloes, one pound; White Canella, three ounces. Rub them separately to powder; then mix them.”

The canella covers the unpleasant flavour of the aloes; and this combination is sometimes used as a warm stimulating cathartic. It is generally made into a tincture, by infusing it in spirit.

PULVIS ALOES CUM GUIACO. Powder of Aloes with Guaiac. *Pharm. Lond.*

“Take of Socotorine Aloes, one ounce and a half; Guaiac Gum-Resin, one ounce; Aromatic Powder, half an ounce. Rub the aloes and guaiac separately into powder; then mix them with the aromatic powder.”

This combination of aloes with guaiac is seldom used. As a stimulating aperient, it may be given in a dose of fifteen or twenty grains.

PULVIS ALOES CUM FERRO. Powder of Aloes with Iron. *Pharm. Lond.*

“Take of Socotorine Aloes, one ounce and a half; Myrrh, two ounces; Dried Extract of Gentian, Sulphat of Iron, of each one ounce. Rub them separately to powder, and mix them.”

This combination affords a remedy of considerable power in amenorrhœa, though the form of powder is not the most proper under which it might be exhibited. Its dose is from ten to fifteen grains at bed-time.

PULVIS CERUSSÆ COMPOSITUS. Compound Powder of Ceruse. *Pharm. Lond.*

“Take of Ceruse, five ounces; Sarcocolla, one ounce and a half; Tragacanth, half an ounce. Rub them together into a powder.”

This is used as an external application to superficial inflammation, diffused in water, and sometimes as a collyrium, or an injection in gonorrhœa.

PULVIS CONTRAYERVÆ COMPOSITUS. Compound
Powder of Contrayerva. *Pharm. Lond.*

“Take of Contrayerva, rubbed to powder, five ounces; Compound Powder of Crabs Claws, one pound and a half.”

There seems little necessity for combining contrayerva with carbonat of lime, which can add nothing to its virtues. The dose of the powder may be half a drachm, or two scruples.

PULVIS MYRRHÆ COMPOSITUS. Compound Powder of
Myrrh. *Pharm. Lond.*

“Take of Myrrh, Dried Savin, Dried Rue, Russian Castor, of each one ounce. Rub them together to a powder.”

This is a combination of some of the more powerful emmenagogues. It may be given in amenorrhœa in the dose of one scruple, or half a drachm.

PLUVIS SENNÆ COMPOSITUS. Compound Powder of
Senna. *Pharm. Lond.*

“Take of Senna, Crystals of Tartar, of each two ounces; Scammony, half an ounce; Ginger, two drachms. Rub the scammony separately, the others together, into a powder, and mix them.”

This may be employed as a purgative, in a dose of from half a drachm to a drachm.

PULVIS TRAGACANTHÆ COMPOSITUS. Compound
Powder of Tragacanth. *Pharm. Lond.*

“Take of Tragacanth, rubbed to powder, Gum-Arabic, Starch, of each one ounce and a half; Refined Sugar, three ounces. Rub them together into powder.”

This combination of mucilaginous substances may be employed for the general purposes of demulcents, in the dose of a drachm, or more frequently repeated.

CHAPTER XXII.

ELECTUARIA.—ELECTUARIES.

ELECTUARIES are compositions of the consistence nearly of honey, and are generally made by adding to any powder a sufficient proportion of syrup or mucilage. It is a form adapted to the exhibition of such medicines as are not ungrateful in taste or flavour. The ingredients are so proportioned, that the dose shall not be less than a tea-spoonful, and not more than twice or thrice that quantity, at a time.

ELECTUARIUM AROMATICUM. Aromatic Electuary.
[Confect. Aromat.]

“Take of Aromatic Powder, one part; Syrup of Orange Peel, two parts. Mix, beating them well together, so as to form an electuary.”

This is a grateful aromatic preparation, frequently combined with other medicines, or made the basis of cordial mixtures.

ELECTUARIUM CASSIÆ FISTULÆ. Electuary of Purg-
ing Cassia. [Elect. Cassiæ.]

“Take of the Pulp of Cassia in pods, four parts; Pulp of Tamarind, Manna, of each one part; Syrup of Pale Rose, four parts. Dissolve the manna beat in a mortar, with a gentle heat, in the syrup; then add the pulps, and, by a continued heat, reduce the mixture to a proper consistence.”

This electuary is scarcely ever used. It is a mild laxative in the dose of an ounce.

ELECTUARIUM CASSIÆ SENNÆ: *olim, Electuarium Lenitivum.* Electuary of Senna. [Elect. Sennæ.]

“Take of the Leaves of Senna, eight ounces; Coriander Seeds, four ounces; Liquorice Root, three ounces; Figs, one pound; Pulp of Tamarind, Pulp of Cassia, Pulp of Prunes, of each half a pound; Refined Sugar, two pounds and a half. Rub the senna with the coriander seeds, and separate by passing through a sieve ten ounces of the mixed powder. Boil the residuum with the figs and the liquorice, in four pounds of water to one half; then express and strain. Reduce the strained liquor, by evaporation, to about one pound and a half. Afterwards add the sugar, so as to make a syrup. Add this syrup gradually to the pulps; and, lastly, mix in the powder.”

This electuary is in very common use as a mild and pleasant purgative. Its dose is six drachms, or an ounce.

ELECTUARIUM CATECHU: *olim, Confectio Japonica.*
Electuary of Catechu.

“Take of Extract of Catechu, four ounces; Kino, three ounces; Bark of Cinnamon, Nutmeg, of each one ounce; Opium, diffused in a sufficient quantity of Spanish White Wine, one drachm and a half; Syrup of Red Rose, boiled to the consistence of honey, two pounds and a quarter. Reduce the solid ingredients to powder, and, mixing with them the opium and syrup, form an electuary.”

This electuary affords a combination of the more powerful astringents, rendered grateful by aromatics, and having its efficacy, as a remedy in diarrhœa, increased by the opium. It is the basis of the common extemporaneous astringent mixture. One grain of opium is contained in rather more than three drachms.

ELECTUARIUM OPIATUM: *olim, Electuarium Thebæicum.* Opiate Electuary. [Confectio Opiata.]

“Take of Aromatic Powder, six ounces; Virginian Snake-root, rubbed to a fine powder, three ounces; Opium, diffused in a sufficient quantity of Spanish White Wine, half an ounce; Syrup of Ginger, one pound. Mix, so as to form an electuary.”

This has kept its place in the Pharmacopœias as a substitute for the Mithridate and Theriaca Andromachi; officinal preparations once highly celebrated, but now discarded. Each drachm, prepared according to the formula in the Edinburgh Pharmacopœia, contains a grain and a half of opium; and rather more in that prepared by the prescription of the London College.

ELECTUARIUM SCAMMONII. Electuary of Scammony.
Pharm. Lond.

“Take of Scammony, rubbed to powder, one ounce and a half; Cloves, Ginger, of each six drachms; Oil of Caraway, half a drachm; Syrup of Roses, as much as may be sufficient. Mix the aromatics, rubbed together into a powder, with the syrup; then add the scammony, and, lastly, the oil of caraway.”

This is a stimulating cathartic; its medium dose is one drachm.

CHAPTER XXIII.

PILULÆ.—PILLS.

PILLS are formed from a mass sufficiently stiff and adhesive to preserve the round form which is given to them; this due consistence being obtained by adding to powders a sufficient quantity of syrup, mucilage, or conserve. It is a form adapted to the exhibition of such medicines as are nauseous in taste or flavour, and such as operate in a small dose. A pill ought not to exceed five grains in weight, or twelve may be formed from a drachm of the mass.

PILULÆ ALOETICÆ. Aloetic Pills.

“Take of Socotorine Aloes, in powder, Soap, of each equal parts. Beat them with Simple Syrup, so as to make a mass fit for forming pills.”

PILULÆ ALOES COMPOSITÆ. Compound Aloes Pills.
Pharm. Lond.

“Take of Socotorine Aloes, in powder, one ounce; Extract of Gentian, half an ounce; Oil of Caraway, two scruples; Syrup of Ginger, as much as necessary. Beat them together.”

Under either of these simple forms aloes is very commonly exhibited as a cathartic. Two pills are a medium dose.

PILULÆ ALOES CUM ASSAFOETIDA. Pills of Aloes with
Assafœtida.

“Take of Socotorine Aloes, Assafœtida, Soap, of each equal parts. Beat them into a mass with mucilage of gum Arabic.”

These pills have been given in dyspepsia and amenorrhœa, two or three being taken at bed-time occasionally.

PILULÆ ALOES CUM COLOCYNTHIDE. Pills of Aloes with Colocynth.

“Take of Socotorine Aloes, Scammony, of each eight parts, Colocynth, four parts; Sulphat of Potash with Sulphur, Oil of Cloves, of each one part. Let the aloes and scammony be reduced, with the salt, to powder; then let the colocynth, rubbed into a fine powder, and the oil, be added. Lastly, beat them with mucilage of gum Arabic into a mass.”

This is a more powerful cathartic than the simple aloetic pill, and is used in constipation, or to obviate habitual costiveness. Two pills are a common dose.

PILULÆ ALOES CUM MYRRHA. Pills of Aloes with Myrrh. [Pilulæ Aloes cum Myrrha.]

“Take of Socotorine Aloes, four parts; Myrrh, two parts; Saffron, one part. Beat them into a mass with Simple Syrup.”

This composition has long been in use in medical practice as a stimulating aperient. Two or three pills are taken at bed-time.

PILULÆ ASSAFOETIDÆ COMPOSITÆ. Compound Assafœtida Pills.

“Take of Assafœtida, Galbanum, Myrrh, of each eight parts; Rectified Oil of Amber, one part. Beat them into a mass with Simple Syrup.”

These pills are used in hysteria and amenorrhœa, two or three of them being taken at bed-time.

PILULÆ GALBANI COMPOSITÆ. Compound Pills of Galbanum. *Pharm. Lond.*

“Take of Galbanum, Opoponax, Myrrh, Sagapenum, of each one ounce; Assafœtida, half an ounce; Syrup of Saffron, as much as may be sufficient. Beat them together.”

These pills are similar to the preceding; are used in the same cases, and in the same dose.

PILULÆ AMMONIURETI CUPRI. Pills of Ammoniuret of Copper.

“Take of Ammoniuret of Copper, sixteen grains; Crumb of Bread, four scruples; Water of Carbonat of Ammonia, as much as may be sufficient. Beat them into a mass, which divide into thirty-two equal pills.”

It is under this form that ammoniuret of copper is given in epilepsy and the other spasmodic diseases in which it has been employed. Half a grain of it is contained in each pill. One pill is given at first, night and morning, and the dose is gradually increased.

PILULÆ HYDRARGYRI. Mercurial Pill. [*Pilulæ Hydrargyri.*]

“Take of Purified Quicksilver, Conserve of Red Rose, of each one ounce; Starch, two ounces. Rub the quicksilver with the conserve, in a glass mortar, until the globules entirely disappear, adding, as there may be occasion, a little mucilage of gum Arabic; then add the starch, and beat, with a little water, into a mass, which is to be immediately divided into four hundred and eighty pills.”

During the trituration of the quicksilver with the conserve, it is not merely mechanically divided, but oxydized by the atmospheric air, and the efficacy of the pill depends on the gray oxyd formed: hence much depends on the proper trituration. It is the preparation of mercury

that is most generally employed for internal use; and, while it is much milder in its operation than some others, it is perhaps capable of answering every purpose which the remedy can serve. The common dose, given with the view of inducing the usual mercurial action, is two pills at bed-time and one in the morning, which, in particular cases and habits, requires to be increased. Four or six pills given at once generally excite purging.

PILULÆ OPIATÆ: *olim, Pilulæ Thebaicæ.* Opiate Pills.
[Pilulæ Opii.]

“ Take of Opium, one part; Extract of Liquorice, seven parts; Jamaica Pepper, two parts. Mix the opium and the extract separately, softened with diluted alcohol, and beat them into a pulp; then add the Jamaica pepper rubbed to powder, and, beating them well, reduce them to a mass.”

This affords a form under which the exhibition of opium may be concealed from the patient. Two pills contain one grain of opium. In the formula of the London College, the aromatic is omitted, and the proportion of opium increased; so that each pill contains one grain.

PILULÆ RHEI COMPOSITÆ. Compound Pills of Rhubarb.

“ Take of the Root of Rhubarb, one ounce; Socotorine Aloes, six drachms; Myrrh, half an ounce; Oil of Peppermint, half a drachm. Beat them into a mass with syrup of orange peel.”

This is a moderate laxative much employed, especially in dyspeptic affections to obviate costiveness, and stimulate gently the stomach and intestines. Two pills are taken at bed-time.

PILULÆ SCILLITICÆ. Squill Pills. [*Pilulæ Scillæ.*]

“ Take of the dried Root of Squill, rubbed to a fine powder, one scruple; Gum-Ammoniac, Smaller Cardamom Seeds, in powder, Extract of Liquorice, of each one drachm. Beat them with Simple Syrup into a mass.”

Under this form squill is often given as an expectorant in asthma and chronic catarrh. Two pills are taken twice a-day.

CHAPTER XXIV.

TROCHISCI.—TROCHES.

TROCHES, or Lozenges, consist of powders brought to a solid form by the addition of mucilage. When moist, they form a soft paste, in which state they are cut into small square or round pieces, and these are hardened by drying. It is a form adapted principally to such medicines as are designed to dissolve slowly in the mouth; and hence they are always rendered pleasant by the addition of a large proportion of sugar. They are seldom active remedies.

TROCHISCI CARBONATIS CALCIS. Troches of Carbonat of Lime. [*Trochisci Cretæ.*]

“ Take of Prepared Carbonat of Lime, four ounces; Gum Arabic, one ounce; Nutmeg, one drachm; Refined Sugar, six ounces. Rub these to powder, and make it into a mass with water, fit for forming troches.”

This is a pleasant form under which carbonat of lime may be given as an antacid. The London College, in their formula, order Cinnamon instead of Nutmeg.

TROCHISCI GLYCYRRHIZÆ. Liquorice Troches. [Trochis. Glycyrrhiz.]

“Take of Extract of Liquorice, Gum-Arabic, of each one part; Refined Sugar, two parts. Let them be dissolved in warm water, and strained. Then evaporate the solution, with a gentle heat, into a mass, which form into troches.”

These, from their demulcent quality, may be used to allay coughing, in catarrh; but the simple Extract of Liquorice is equally effectual, and they are scarcely ever used.

TROCHISCI GLYCYRRHIZÆ CUM OPIO. Liquorice Troches with Opium.

“Take of Opium, two drachms; Tincture of Tolu Balsam, half an ounce; Simple Syrup, eight ounces; Extract of Liquorice, softened with Warm Water, Gum Arabic, in powder, of each five ounces. First, rub the opium with the tincture; then add gradually the syrup and the extract; afterwards sprinkle in the powder of gum Arabic; and, lastly, dry the mass, that it may be formed into troches, each weighing ten grains.”

These troches are very effectual in relieving the tickling cough frequently attending catarrh. The opium is the active ingredient; the others cover its taste and flavour, and render the composition pleasant, adding at the same time a demulcent quality. One drachm, or six troches, contain one grain of opium; and from six to twelve may be taken in twenty-four hours.

TROCHISCI GUMMOSI. Gum Troches.

“Take of Gum Arabic, four parts; Starch, one part; Refined Sugar, twelve parts. These being powdered, are to be formed into a mass, with rose water, fit for forming troches.”

This composition is designed as a demulcent, but is not in use; gum Arabic, when pure, answering the same purpose equally well.

TROCHISCI NITRATIS POTASSÆ. Troches of Nitrat of Potash. [Troch. Nitri.]

“ Take of Nitrat of Potash, one part; Refined Sugar, three parts. Beat them to powder, and, with mucilage of gum tragacanth, make them into a mass proper for forming troches.”

Under this form, nitrat of potash is sometimes used as a refrigerant in angina tonsillaris, and to allay the sense of heat attending salivation.

TROCHISCI AMYLI. Starch Troches. *Pharm. Lond.*

“ Take of Starch, one ounce and a half; Liquorice, six drachms; Florentine Orris, half an ounce; Refined Sugar, one pound and a half. Rub these to powder, and, with mucilage of tragacanth, form troches. They may be made, if it be preferred, without the orris.”

These troches may exert some demulcent power, and may therefore be employed in catarrh; but they are little in use.

TROCHISCI MAGNESIÆ. Magnesia Troches. *Pharm. Lond.*

“ Take of Burnt Magnesia, four ounces; Refined Sugar, two ounces; Ginger, in powder, one scruple. Rub them together, and, adding mucilage of gum Arabic, form them into troches.”

This is a pleasant form for giving magnesia as an antacid.

TROCHISCI SULPHURIS. Sulphur Troches. *Pharm. Lond.*

“Take of Washed Flowers of Sulphur, two ounces; Refined Sugar, four ounces; Mucilage of Quince Seeds, as much as may be sufficient. Rub them together, and form troches.”

This is designed as an agreeable form for the exhibition of sulphur.

CHAPTER XXV.

LINIMENTA, UNGUENTA, ET CERATA.—LINIMENTS, OINTMENTS, AND CERATES.

THESE are similar forms, consisting of unctuous matters, and differing merely in the degree of consistence. A Liniment is of the consistence of thin honey; an Ointment is firmer; and a Cerate still harder. Oil or lard is their common basis; the due consistence is given by wax or spermaceti, and to the composition may be added any substance which is to be used under this form. The following general directions are given in the Edinburgh Pharmacopœia for their preparation:

“In making these compositions, fat and resinous substances are to be melted with a gentle heat, stirring them constantly, sprinkling in, at the same time, dry ingredients, if there are any, in fine powder, until the mixture, by cooling, become stiff.”

LINIMENTUM SIMPLEX. Simple Liniment.

“Take of Olive Oil, four parts; White Wax, one part.”

UNGUENTUM SIMPLEX. Simple Ointment.

“Take of Olive Oil, five parts; White Wax, two parts.”

CERATUM SIMPLEX. Simple Cerate. [Ceratum Sper-
matis Ceti.]

“Take of Olive Oil, six parts; White Wax, three parts; Spermaceti, one part.”

These compositions differ merely in consistence. They are applied spread on linen, as usual dressings to slight wounds and excoriations.

UNGUENTUM ADIPIS SUILLÆ. Ointment of Hogs Lard.
Pharm. Lond.

“Take of Prepared Hogs Lard, two pounds; Rose Water, three ounces. Beat the lard with the rose water until they are mixed; then liquify with a gentle heat, and put it aside, that the water may subside. Afterwards pour off the ointment, stirring it constantly until it has cooled.”

This is similar to the preceding, and is used for the same purposes. It is perhaps more liable to become rancid.

UNGUENTUM RESINOSUM. Resinous Ointment. [Un-
guent. Resin. Flav.]

“Take of Hogs Lard, eight parts; White Resin, five parts; Yellow Wax, two parts.”

This is more stimulating than the preceding, and is used as a dressing where the object is to promote sup-
puration.

UNGUENTUM PULVERIS MELOES VESICATORII: *olim*,
Unguentum Epispasticum Fortius. Ointment of the
Powder of Cantharides. [Cerat. Cantharid.]

“Take of Resinous Ointment, seven parts, Powder of Cantharides, one part.”

This is the ointment commonly employed to establish a purulent discharge, or form an issue in the part to which

a blister has been applied; which it does from the acrid and stimulating quality of the cantharides.

UNGUENTUM INFUSI MELOES VESICATORII: *olim, Unguentum Epispasticum Mitius.* Ointment of Infusion of Cantharides. [Unguent. Canthar.]

“Take of Cantharides, White Resin, Yellow Wax, of each one part; Venice Turpentine, Hogs Lard, of each two parts; Boiling Water, four parts. Macerate the cantharides in the water for a night, and strain the liquor, pressing it strongly; having added the lard, boil the liquor till the water is evaporated; then add the wax and resin. These being melted and removed from the fire, add the turpentine.”

The ointment with the powder of cantharides sometimes occasions too much pain and irritation. In such cases, the ointment from the infusion of cantharides being milder, is employed, and is still sufficiently stimulating to keep up the purulent discharge.

UNGUENTUM SUB-ACETITIS CUPRI: *olim, Unguentum Æruginis.* Ointment of Sub-Acetite of Copper, or Verdigris.

“Take of Resinous Ointment, fifteen parts; Sub-Acetite of Copper, one part.”

This ointment is used as an escharotic, applied to foul ulcers. It in general requires to be mixed with an additional proportion of resinous or simple ointment.

UNGUENTUM HYDRARGYRI: *vulgo, Unguentum Cæruleum.* Ointment of Quicksilver.

“Take of Quicksilver, Mutton Suet, of each one part; Hogs Lard, three parts. Rub them carefully in a mortar, until the globules of quicksilver disappear. It may be made also with a double or triple proportion of quicksilver.”

UNGUENTUM HYDRARGYRI FORTIUS. Stronger Ointment of Quicksilver. *Pharm. Lond.*

“Take of Purified Quicksilver, two pounds; Prepared Hogs Lard, twenty-three ounces; prepared Tallow, one ounce. Rub first the quicksilver with the tallow and a little lard, until the globules disappear; then add the remaining lard, so as to form an ointment.”

UNGUENTUM HYDRARGYRI MITIUS. Milder Ointment of Quicksilver. *Pharm. Lond.*

“Take of the Stronger Ointment of Quicksilver, one part; Prepared Hogs Lard, two parts. Mix them.”

During the trituration of mercury with unctuous matter, it cannot be doubted that an oxydation of the metal is effected; and the efficacy of the ointment depends in a great measure on this oxyd of mercury. It has been also supposed, with sufficient probability, that the portion of sebatic acid formed in animal fat, when exposed to the air, may promote this oxydation, and combine with the oxyd; and the improvement of the ointment on keeping, a fact long observed, it is probable is owing to this gradual formation of scbat of mercury.

Mercurial ointment is the form under which mercury is introduced into the system by external friction. It is a mode employed with advantage in cases where the preparations administered internally are liable to be too much determined to the intestines, so as to occasion griping and purging, and when it is necessary to introduce a large quantity of mercury speedily into the system; likewise in some local affections, particularly bubo. One drachm of the strong ointment, (that containing equal parts of mercury and lard), is introduced by friction in the evening, and frequently also in the morning, until the system is affected. The weaker ointments ought not to be employed, as they merely give unnecessary trouble, by the necessity of rubbing in so much lard.

UNGUENTUM OXIDI HYDRARGYRI CINEREI. Ointment of Gray Oxyd of Quicksilver.

“ Take of Gray Oxyd of Quicksilver, one part; Hogs Lard, three parts.”

This is designed as a substitute for the mercurial ointment, and, as the quicksilver is fully oxydated, it has been supposed that it will prove more active.

UNGUENTUM OXIDI HYDRARGYRI RUBRI. Ointment of Red Oxyd of Quicksilver.

“ Take of Red Oxyd of Quicksilver by Nitric Acid, one part; Hogs Lard, eight parts.”

This is applied as a mild escharotic to remove the diseased surface of ulcers, and as a stimulant to promote suppuration.

UNGUENTUM CALCIS HYDRARGYRI ALBÆ. Ointment of White Calx of Quicksilver. *Pharm. Lond.*

“ Take of White Oxyd of Quicksilver, one drachm; Ointment of Hogs Lard, one ounce and a half. Mix them so as to form an ointment.”

This ointment is sometimes used as an application in psora, and other cutaneous affections.

UNGUENTUM NITRATIS HYDRARGYRI FORTIUS: *vulgo, Unguentum Citrinum*. Stronger Ointment of Nitrat of Quicksilver. [Unguent. Hydrargyr. Nitrat.]

“ Take of Purified Quicksilver, one part; Nitrous Acid, two parts; Hogs Lard, twelve parts. Digest the quicksilver with the nitrous acid, in a sand-bath, until a solution is obtained, which, while it is hot, is to be mixed with the hogs lard melted and beginning to cool. Beat the mixture thoroughly in a glass mortar, so as to form an ointment.”

In this ointment the nitrat of quicksilver is combined with the lard; and as there is also an excess of nitric acid, it acts chemically on the fat, and gives to the composition a very firm consistence. It is an excellent application to certain cutaneous affections, a small quantity being rubbed on the part.

UNGUENTUM NITRATIS HYDRARGYRI MITIUS.
Milder Ointment of Nitrat of Quicksilver.

“ This is made in the same manner as the preceding, with a triple proportion of lard.”

It is of course a much milder application, and is designed to be also of a softer consistence; but, to obtain the latter convenience, it is better to reduce the strong ointment with the requisite proportion of lard.

UNGUENTUM ACIDI NITROSI. Ointment of Nitrous Acid.

“ Take of Hogs Lard, one pound; Nitrous Acid, six drachms. Mix the acid gradually with the melted lard, and beat the mixture thoroughly while it cools.”

In this preparation part of the acid is decomposed, and part of it combined with the lard. It is designed as an application in cutaneous affections, and is similar in its effects to the preceding ointment.

UNGUENTUM OXIDI PLUMBI ALBI. Ointment of White Oxyd of Lead.

“ Take of Simple Ointment, five parts; Oxyd of Lead, one part.”

This has been used principally as an application to burns and superficial inflammation.

UNGUENTUM ACETITIS PLUMBI: *vulgo, Unguentum Saturninum*. Ointment of Acetite of Lead. [Unguent. Cerussæ Acetatæ.]

“Take of Simple Ointment, twenty parts; Acetite of Lead, one part.”

This ointment is applied to the same purposes as the preceding, and is more frequently used.

CERATUM LITHARGYRI ACETATI COMPOSITUM. Compound Cerate of Acetated Litharge. *Pharm. Lond.*

“Take of Water of Acetated Litharge, two ounces and a half; Yellow Wax, four ounces; Olive Oil, nine ounces; Camphor, half a drachm. Rub the camphor with a little of the oil. Melt the wax with the remaining oil, and as soon as the mixture begins to become thick, pour on gradually the water of acetated litharge, and stir constantly until the mixture has cooled; then mix with it the camphor rubbed with the oil.”

This ointment, usually named *Goulard's Cerate*, differs little from the preceding, and is applied to similar uses.

CERATUM CARBONATIS ZINCI IMPURI: *olim, Ceratum Lapidis Calaminaris*. Cerate of Impure Carbonat of Zinc. [Cerat. Lapid. Calam.]

“Take of Simple Cerate, five parts; Prepared Impure Carbonat of Zinc, one part.”

This is the common healing cerate applied to slight wounds, excoriations, &c.; and as a dressing to ulcers. The carbonat of zinc seems to give it merely a stiffer consistence.

UNGUENTUM OXIDI ZINCI IMPURI: *olim, Unguentum Tutiaë*. [Unguent. Tutiaë.]

“Take of Simple Liniment, five parts; Prepared Impure Oxyd of Zinc, one part.”

This has been used principally as an application in chronic ophthalmia.

UNGUENTUM OXIDI ZINCI. Ointment of Oxyd of Zinc.

“Take of Simple Liniment, six parts; Oxyd of Zinc, one part.”

Ointment of oxyd of zinc is sometimes used as a dressing to ulcers, and sometimes as an application in ophthalmia.

UNGUENTUM PICIS. Ointment of Tar. [Unguent. Picis.]

“Take of Tar, five parts; Yellow Wax, two parts.”

This stimulating ointment is sometimes applied to foul ulcers, and has been also used with advantage in tinea capitis.

UNGUENTUM SULPHURIS. Ointment of Sulphur. [Unguent. Sulph.]

“Take of Hogs Lard, four parts; Sublimed Sulphur, one part. To each pound of this ointment, add of Essential Oil of Lemon, or Essential Oil of Lavender, half a drachm.”

Under this form, sulphur is applied, by friction, as a remedy in psora.

UNGUENTUM ELEMI COMPOSITUM. Compound Ointment of Elemi. *Pharm. Lond.*

“Take of Elemi, one pound; Common Turpentine, ten ounces; Prepared Suet, two pounds; Olive Oil, two ounces. Melt the elemi with the suet, and having removed it from the fire, mix it immediately with the turpentine and oil; then strain the mixture.”

This ointment is moderately stimulating, somewhat similar to the resinous ointment.

UNGUENTUM HELLEBORI ALBI. Ointment of White Hellebore. *Pharm. Lond.*

“Take of White Hellebore, rubbed to powder, one ounce; Ointment of Hogs Lard, four ounces; Essence of Lemon, half a scruple. Mix them, so as to form an ointment.”

Hellebore is used, under this form, as an application to psora. It is sometimes effectual, and is less disagreeable than the sulphur ointment.

UNGUENTUM SAMBUCCI. Ointment of Elder. *Pharm. Lond.*

“Take of the Flowers of Elder, four pounds; Prepared Mutton Suet, three pounds; Olive Oil, one pound. Boil the flowers of elder with the suet and the olive oil until they become friable; then press out the fluid, and strain it.”

The elder flowers communicate nothing to the unctuous matter, but a rich green colour.

CERATUM SAPONIS. Cerate of Soap. *Pharm. Lond.*

“Take of Soap, eight ounces; Yellow Wax, ten ounces; Litharge, in powder, one pound; Olive Oil, one pound; Vinegar, one gallon. Boil the vinegar with the litharge on a gentle fire, stirring constantly until the mixture become uniform and thick; then mix with it the other ingredients, so as to form a cerate.”

This composition must derive any efficacy it has, principally from the acetite of lead, formed by the boiling of the vinegar on the litharge.

CHAPTER XXVI.

EMPLASTRA.—PLASTERS.

PLASTERS differ from Ointments in their much firmer consistence, which is such, that they do not adhere to the hand, and require to be heated in order to be spread. They owe this consistence, in general, to a larger proportion of wax, or sometimes to the addition of certain metallic oxyds, particularly those of lead, which unite chemically with the unctuous matter. The same rules are to be observed in their preparation, as in that of Ointments.

EMPLASTRUM SIMPLEX: *olim*, *Emplastrum Cereum*.
Simple Plaster. [Emplastrum Ceræ Composit.]

“Take of Yellow Wax, three parts; Mutton Suet, Resin, of each two parts.”

The principal use of this plaster is as a dressing, when spread thin on linen, to the part to which a blister has been applied.

EMPLASTRUM OXIDI PLUMBI SEMI-VITREI: *olim*,
Emplastrum Commune. [Emplastr. Lithargyr.]

“Take of the Semi-vitreous Oxyd of Lead, one part; Olive Oil, two parts. Having added water, boil them, stirring constantly, until the oil and the oxyd unite into a plaster.”

This is a chemical combination of the expressed oil with the oxyd of lead, and is of a consistence sufficiently hard to form a plaster. It is used, spread on leather or linen, as an application to excoriations, or slight wounds.

EMPLASTRUM RESINOSUM: *olim, Emplastrum Adhæsivum.* Resinous Plaster. [Emplastrum Lithargyr. cum Resina.]

“Take of Plaster of Semi-vitreous Oxyd of Lead, five parts; Resin, one part.”

The plaster of litharge is rendered more adhesive, and somewhat stimulating, by this intermixture of resin.

EMPLASTRUM OXIDI FERRI RUBRI: *olim, Emplastrum Roborans.*

“Take of Plaster of Semi-vitreous Oxyd of Lead, twenty-four parts; Resin, six parts; Yellow Wax, Olive Oil, of each three parts; Red Oxyd of Iron, eight parts. Rub the red oxyd of iron with the oil, and add it to the other ingredients melted.”

This, spread on leather, is sometimes used as an application in slight cases of lumbago, and seems to prove useful, merely by affording a mechanical support.

EMPLASTRUM ASSÆ FOETIDÆ. Assafœtida Plaster.

“Take of Plaster of Semi-vitreous Oxyd of Lead, Assafœtida, Galbanum, Yellow Wax, of each one part.”

This plaster is sometimes applied to the breast or side, as a remedy in hysteric affections.

EMPLASTRUM GUMMOSUM. Gum Plaster.

“Take of Plaster of Semi-vitreous Oxyd of Lead, eight parts; Ammoniac, Galbanum, Yellow wax, of each one part.”

This plaster has been used as an application to indolent tumours, and sometimes to promote suppuration.

EMPLASTRUM HYDRARGYRI. Quicksilver Plaster.
[Emplast. Litharg. cum Hydrargyro.]

“Take of Olive Oil, Resin, of each one part; Quicksilver, three parts; Plaster of Semi-vitreous Oxyd of Lead, six parts. Rub the quicksilver with the oil and resin melted together, and then cooled, until the globules disappear; then add, gradually, the plaster of semi-vitreous oxyd of lead, melted, and mix the whole carefully.”

This plaster is applied as a discutient to indolent tumours.

EMPLASTRUM SAPONACEUM. Soap Plaster. [Emplast. Saponis.]

“Take of Plaster of Semi-vitreous Oxyd of Lead, four parts; Gum Plaster, two parts; Soap sliced, one part. Mix the soap with the plasters melted together; then boil a little, so as to form a plaster.”

This has likewise been supposed to possess a discutient quality; but it is much inferior to the mercurial plaster, and is scarcely ever used.

EMPLASTRUM MELOES VESICATORII: *olim, Emplast. Vesicatorium.* Plaster of Cantharides. [Emplast. Cantharid.]

“Take of Mutton Suct, Yellow Wax, Resin, Cantharides, of each equal weights. Mix the cantharides, rubbed into a fine powder, with the other ingredients, melted together, and removed from the fire.”

This is the plaster usually employed to raise a blister. It is of a softer consistence than the other plasters, that it may admit of being spread without the assistance of heat, which would impair the acrid quality of the cantharides. It requires to be applied twelve hours to produce a perfect blister: it is then removed; the vesicle is cut, and the inflamed surface dressed with simple cerate or plaster.

EMPLASTRUM MELOES VESICATORII COMPOSITUM.
Compound Plaster of Cantharides.

“Take of Burgundy Pitch, Turpentine, Cantharides, of each twelve parts; Yellow Wax, four parts; Sub-acetite of Copper, two parts; Mustard Seed, Black Pepper, of each one part. To the Burgundy pitch and wax melted, add the turpentine. When this is melted, and while the fluid is still warm, add the other ingredients mixed and rubbed to a fine powder, stirring constantly, so as to form a plaster.”

It occasionally happens, that the common plaster of cantharides is insufficient to excite a blister, even when its surface has been sprinkled over with powdered cantharides. In such cases, or even in others, where it is necessary that a blister should be quickly raised, this more powerful composition may be employed. Its operation is accompanied with a very pungent sensation of heat.

EMPLASTRUM AMMONIACI CUM HYDRARGYRO. Plas-
ter of Ammoniac with Quicksilver. *Pharm. Lond.*

“Take of Strained Ammoniac, one pound; Purified Quicksilver, three ounces; Sulphurated Oil, one drachm, or as much as may be sufficient. Rub the quicksilver with the sulphurated oil, until the globules disappear; then add gradually the melted ammoniac, and mix them.”

This is similar in its powers to the simple mercurial plaster, and is applied to the same purposes.

EMPLASTRUM CUMINI. Cumin Plaster. *Pharm. Lond.*

“Take of Cumin, Caraway, Bay Berries, of each three ounces; Burgundy Pitch, three pounds; Yellow Wax, three ounces. With the pitch and wax melted, mix the other ingredients rubbed to powder.”

This has been applied to the region of the stomach as a moderate stimulant, certainly with no great effect.

EMPLASTRUM LADANI COMPOSITUM. Compound plaster of Ladanum. *Pharm. Lond.*

“Take of Ladanum, three ounces; Frankincense, one ounce; Cinnamon in powder, Expressed Oil of Nutmeg, of each half an ounce; Oil of Spearmint, one drachm. To the melted frankincense add first the ladanum, softened by heat, then the expressed oil of nutmeg; afterwards mix these and the cinnamon with the oil of spearmint, and beat them in a warm mortar. Keep the plaster in a close vessel.”

This plaster has been applied, like the former, to relieve nausea and flatulence, and is undoubtedly a more powerful stimulant.

EMPLASTRUM LITHARGYRI COMPOSITUM. Compound Litharge Plaster. *Pharm. Lond.*

“Take of Litharge Plaster, three pounds; Strained Galbanum, eight ounces; Common Turpentine, ten drachms; Frankincense, three ounces. Mix the frankincense, rubbed to powder, with the galbanum and turpentine melted, and add the litharge plaster, melted with slow fire.”

This is similar in its qualities to the gum plaster, and is used, like it, as a discutient, and to promote suppuration.

EMPLASTRUM PICIS BURGUNDICÆ COMPOSITUM. Compound Burgundy Pitch Plaster. *Pharm. Lond.*

“Take of Burgundy Pitch, two pounds; Ladanum, one pound; Yellow Resin, Yellow Wax, of each four ounces; Expressed Oil of Nutmeg, one ounce. To the pitch, resin and wax, melted together, add first the ladanum, then the oil of nutmeg.”

Burgundy Pitch, with the addition of a little wax to give it more tenacity, is in common use as a rubefacient, under the form of plaster. The addition of the other in-

gredients of this compound plaster, may render it rather more stimulating.

EMPLASTRUM THURIS COMPOSITUM. Compound Frankincense Plaster. *Pharm. Lond.*

“ Take of Frankincense, half a pound; Dragons Blood, three ounces; Litharge Plaster, two pounds. To the litharge plaster melted, add the others rubbed to powder.”

This is similar to the Plaster of Red Oxyd of Iron of the Edinburgh Pharmacopœia, and is applied to the same uses.

CATAPLASMA.—CATAPLASMS.

CATAPLASMA ALUMINIS. Alum Cataplasm. *Pharm. Lond.*

“ Take the Whites of two Eggs: agitate them with a piece of Alum, until a coagulum is formed.”

This is sometimes employed as an astringent application in some cases of ophthalmia.

CATAPLASMA CUMINI. Cumin Cataplasm. *Pharm. Lond.*

“ Take of Cumin, one pound; Bay Berries, Dried Scordium, Virginian Snake-root, of each three ounces; Cloves, one ounce. Rub them all together into powder; and having added three times their weight of honey, form a cataplasm.”

This has been used as a stimulating cataplasm to parts shewing a disposition to gangrene.

CATAPLASMA SINAPEOS. Mustard Cataplasin. *Pharm.*
Lond.

“Take of Mustard in Powder, Crumb of Bread, of each half a pound; Vinegar, warm, as much as is sufficient. Mix, so as to make a cataplasin.”

This is the common sinapism which is applied with advantage, as a powerful stimulant, to the soles of the feet, in typhus where there is a determination to the head, and in comatose affections.

APPENDIX, No. I.

To this Appendix I have, for the reasons stated in the Preface, referred the medical history of the Gases, of Electricity, and Galvanism.

OF THE GASES EMPLOYED AS REMEDIES.

SUBSTANCES existing in the aërial form, might *a priori* be supposed capable of producing important effects on the system, as by respiration they are brought to act directly on the mass of blood, and induce in it chemical changes. And they actually occasion immediate and striking alterations in the functions of life.

Though the expectations that were at one time formed, with regard to their medicinal efficacy, have not been realized, and the use of them has now been nearly relinquished; yet since they are capable of producing important changes in the state of the functions, and of the general system, and since the proposition must be admitted, that every substance possessed of such powers may be capable of acting as a powerful remedy, they ought not to be entirely lost sight of, or be discarded from the materia medica. In the aerial kingdom, we have actually the two extremes of Stimulant and Sedative Power.

The modes of preparing these gases are, in a great measure, peculiar to each of them. The manner of administering them is nearly the same. They may be breathed from a jar placed in water; but this is difficult, from the effort required to sustain the column of water within the jar. This may be partly remedied, by poisoning

the jar in water, or, more completely, by breathing from the Gazometer. But the easiest mode is, for the patient to breath the gas from a silk bag, to which a tube with a stop-cock is affixed. In inspiring and expiring the gas, the nostrils require to be closed.

The gases that have been employed in medicine, may be considered under the divisions of those which *excite*, and those which *depress* the functions of life. To the former order belong,

Gas Oxygenium. Oxygen Gas.

Gas Oxydum Nitrosum. Nitrous Oxyd Gas.

OXYGEN GAS is procured from black oxyd of manganese by heat. A quantity of the oxyd is put into an iron tube, and exposed to a red heat: the gas is transmitted through water, and is allowed to stand over it for some hours before it is breathed.

As oxygen is so immediately necessary to the support of life, it might be supposed, that when afforded in a more pure and concentrated state than that in which we breathe it in atmospheric air, it would prove a salutary agent of no inconsiderable power. To this inference, however, independent of any experience, an objection occurs, founded on some experiments made by Lavoisier, and repeated by Davy, which prove, that when animals are supplied with pure oxygen, or with oxygen mixed with a portion of atmospheric air, still less of it is consumed than in ordinary respiration. But though this fact should be admitted, the greater activity of pure oxygen gas on the system is undoubted. It is shewn by the effects which result from its inspiration, and still more forcibly by the fact ascertained by Priestley, Lavoisier, and Davy, that animals confined in air, with an increased proportion of oxygen, die before it is exhausted, and even while the air which they breathe contains more oxygen than common air, and can enable another animal to live.

Oxygen, when respired, acts partly by communicating a stimulating quality to the blood, by which the left side

of the heart and the arterial system are excited to action. The phenomena of asphyxia from its abstraction, prove that it likewise exerts some other operation more immediately subservient to the functions of life.

The diseases in which oxygen gas has been administered, are principally those of chronic debility,—chlorosis, asthma, scrofula, dropsy, paralysis, and some cutaneous affections. It requires to be diluted with from ten to twenty or more parts of atmospheric air, increasing the proportion of oxygen according to the effects produced. From one to two quarts of oxygen are given, by breathing it in its diluted state, at intervals, in the course of the day. It generally increases the force and velocity of the pulse.

NITROUS OXYD GAS.—This gas, a compound of oxygen and azot, in the proportion of thirty-seven of the former to sixty-three of the latter, is most economically obtained, and in greatest purity, from the decomposition of nitrat of ammonia by heat. When this salt is exposed to a temperature about 400° of Fahrenheit's scale, its principles react on each other, and enter into new combinations. The hydrogen of the ammonia attracts part of the oxygen of the nitric acid to form water; and the remaining oxygen combining with the azot both of the acid and of the ammonia, forms this particular compound, nitrous oxyd, which is disengaged in the gaseous form. It requires to stand some hours to deposite a small portion of saline matter, before it is fit to be breathed.

The effects of nitrous oxyd gas on the system, when it is respired, are scarcely analogous to those of any other agent. The excitement which it produces is extended to the functions of body and mind with more rapidity and force than that arising from the action of the most powerful stimulants. It is accompanied with sensations as various as they are peculiar; and, what still more marks the singularity of its operation, this high excitement of the functions of life and exhilaration of mind are not followed by proportional languor or debility; the state of the system gradually returns to the healthy stan-

dard, without any apparent waste of power. A substance capable of acting in such a manner, we might suppose, would prove one of our most valuable remedies. The transient nature of its operation must undoubtedly limit its medicinal efficacy; but still, in diseases of extreme debility, we seem justified in expecting from its administration the most beneficial effects. It has not, however, been very extensively employed. In paralysis it has been used with advantage. In diseases of increased sensibility, it may prove hurtful; and when breathed by delicate females, it has, in more than one instance, induced hysteric affections. The dose which is requisite to produce its peculiar effects varies from four to nine quarts, which may be breathed pure or diluted with an equal part of atmospheric air. It cannot be breathed undiluted for more than four minutes and a half, insensibility being induced.

Nothing satisfactory can be said as to its mode of action, since we know so little of the connexion which subsists between the phenomena of life and the chemical changes which go on in the system. We can only mark the dissimilarity of its operation to that of any other physical agent.

UNDER the second sub-division of the Gases,—those which depress the functions of life, might probably be placed all the substances existing in the aerial form, oxygen and nitrous oxyd excepted. The following are those which have been medicinally employed:

Gas Hydrogenium. Hydrogen Gas.

Gas Azoticum. Azotic Gas.

Gas Acidum Carbonicum. Carbonic Acid Gas.

Gas Hydrogenium Carbonatum. Carbonated Hydrogen Gas.

HYDROGEN GAS, when it is to be breathed, is to be procured by passing water in vapour over pure iron heated to the temperature of ignition. The iron attracts the oxygen of the water, and the hydrogen assumes the aerial form.

Hydrogen gas received into the lungs does not appear to exert any positive deleterious power: all its effects seem referable merely to the exclusion of oxygen. In a pure state, if the lungs have been previously emptied as much as possible of atmospheric air, it cannot be breathed above three quarters of a minute. It quickly occasions a giddiness and sense of suffocation; the countenance becomes livid, and the pulse sinks rapidly; but, when diluted with two-thirds or an equal part of atmospheric air, it can be safely breathed; nor does it appear to produce any very important effect. It occasions some diminution of muscular power and sensibility, and a reduction of the force of the circulation. It has been used in catarrh, hæmoptysis, and phthisis, but its powers seem merely those of a palliative.

AZOT.—What has been said of hydrogen applies likewise to azot. It seems to exert no positive action on the system, but to produce its effects by excluding oxygen. As it is not so easily obtained pure as hydrogen, it has been less employed.

CARBONIC ACID GAS.—To obtain this gas in a proper state of purity for breathing, carbonat of lime (chalk or white marble), is exposed to a strong red heat in an iron tube. The carbonic acid which is disengaged is collected over water, as it is not immediately largely absorbed by that fluid.

This acid gas, when it is inspired, proves more speedily fatal than azot or hydrogen. It appears to excite spasmodic contraction of the epiglottis, so as very speedily to induce suffocation; and it has this effect, even when diluted with nearly an equal part of atmospheric air.

The respiration of carbonic acid gas was employed at an earlier period than that of the other gases. It was celebrated as a remedy in phthisis. In the many cases however in which it has been tried, though it might lessen the expectoration, diminish the hectic fever, and act as an anodyne, there is little evidence of its having ultimately effected a cure. It is given diluted with four or six parts of atmospheric air.

Carbonic acid has likewise been employed as a local application to cancer and painful ulceration, and has at least been serviceable as a palliative. A stream of it is directed on the part by means of a flexible tube. A cataplasm, formed of substances in a state of fermentation has, in some measure, a similar effect.

CARBONATED HYDROGEN GAS.—The gas which has been used in medicine under this name is obtained by passing the vapour of water over charcoal at the temperature of ignition, in an iron tube. The oxygen of the water unites with one part of the charcoal, forming carbonic acid; the hydrogen combines with another part of it, and forms this species of carbonated hydrogen. The carbonic acid is abstracted by agitating the gas in lime-water.

This is the most active of those gases which operate by depressing the functions of life, and is perhaps the most powerful agent of this kind. Even when largely diluted with atmospheric air, it occasions immediate vertigo, sickness, diminution of the force and velocity of the pulse, reduction of muscular vigour, and in general every symptom of diminished power. It can scarcely be breathed in an undiluted state. Mr. Davy found, that at the third inspiration, total insensibility was induced, and symptoms of extreme debility continued for a considerable time.

As a medicinal agent, it is the gas of which the evidence in favour of its efficacy is greatest. In phthisis, in many cases, it unequivocally relieved the symptoms, and at least arrested the progress of the disease. Much caution is requisite with regard to the dose. At first, one pint

of the carbonated hydrogen gas, diluted with twenty parts of atmospheric air, may be respired; the quantity may be slowly increased, and with less dilution, taking care to avoid the production of great vertigo or muscular debility. Not more than from two to four quarts can be taken in the day, even when the patient has been accustomed to it for some time. It is always more powerful when recently prepared, than when it has been kept for some days.

ELECTRICITY.

THE medicinal operation of electricity may be referred to its stimulant power. It produces forcible contractions in the irritable fibre; excites therefore to action, if duly applied; and, when in excess, immediately exhausts irritability. It possesses the important advantages of being easily brought to act locally, and of being confined to the part to which it is applied, while it can also be employed in every degree of force.

Electricity is applied to the body under the form of a stream or continued discharge of the fluid, under that of sparks, and under that of a shock; the first being the most gentle, the second being more active, and the last being much more powerful than either of the others. The stream is applied by connecting a pointed piece of wood, or a metal wire, with the prime conductor of the electrical machine, and holding it by a glass handle one or two inches distant from the part to which it is to be directed. A very moderate stimulant operation is thus excited, which is better adapted to some particular cases than the more powerful spark or shock. The spark is drawn by placing the patient on the insulated stool connected with the prime conductor, and, while the machine is worked, bringing a metal knob within a short distance of the part from which the spark is to be taken. A sensation somewhat pungent is excited, and slight muscular contractions may be produced; these effects being greater or less, according to the distance at which

the knob is held, if the machine be sufficiently powerful. The shock is given by discharging the Leyden phial, making the part of the body through which it is intended to be transmitted, part of the circuit. The sensation it excites is unpleasant, and the muscular contractions considerable, if the shock is moderately strong.

At the first introduction of electricity as a remedy, it was very highly celebrated for its efficacy in a number of diseases; its use is now confined to a few. In paralysis it is very generally had recourse to, to excite muscular contraction, and perhaps with some advantage. It is usually applied under the form of sparks, the application of it requiring to be continued daily for a considerable time. Sometimes moderate shocks are also employed; but the propriety of this practice is somewhat doubtful. In ammenorrhœa, as the stimulant operation can be excited, in some measure, in the vessels which are affected, advantage may be derived from electricity; and it is occasionally used, both under the form of sparks taken from the pelvis, and that of moderate shocks transmitted through it. Ophthalmia, and some other varieties of inflammation, have been removed by the electric stream; it has also sometimes succeeded in discussing tumors, and relieving pain. The general rule for the medical employment of electricity, is to apply it at first under the milder forms, and gradually to raise it, if necessary, to the more powerful.

GALVANISM.

THE peculiar power which is generated when two metals moistened are in contact, at first named Animal Electricity, since Galvanism, has been recently applied as a remedy in various morbid affections. Its effects on the animal system are such as warrant this application. Its activity is shewn by its exciting strong sensations in sensible parts, and powerful contractions in parts endowed with irritability.

Between galvanism and electricity there are so many points of resemblance, that they have been considered as ultimately the same power, or as the same subtile matter in different states. Whether this opinion be just or not, the effects of galvanism on living matter are different from those of electricity. The sensation which the former excites, though somewhat analogous to that produced by the latter, is still dissimilar; the action of galvanism is more extended, both to the nervous and muscular systems, than that of electricity, which is more local in its action. The galvanic excitation produces sensations and contractions in parts, which, from disease, are not sensible to electrical impressions; and the stimulant power which both exert, appears in galvanism, to be greater in proportion to its intensity than in electricity; or the sensations and muscular contractions which the galvanic discharge excites, are more than proportioned to its power of producing electrical phenomena.

The diseases in which galvanism has hitherto been employed, are principally those of the nervous kind. In paralysis, it has been affirmed to have restored the capability of muscular contraction, and consequently the power of motion. Cases of chorea, tetanus, and some other spasmodic affections, have been related, in which perfect cures were accomplished by its application. It appears, in several instances, to have relieved deafness, particularly that species of it arising from torpor of the auditory nerve; and it has been successful in discussing indolent tumours.

Galvanism is applied by connecting two metallic wires with the two extremities of a galvanic battery, and bringing them in contact with the part affected, so that it shall form part of the circuit of the galvanic discharge: the one wire is kept in contact with the part it touches; the other is alternately applied for a moment and removed. If the skin is moistened, the galvanic influence is communicated more readily and effectually; and still more so if a small piece of metallic leaf be laid on the parts to which the wires are applied. Sometimes even the cuticle has been previously removed by a blister, but the application of the galvanism is then attended with pain.

APPENDIX, No. II.

ON MEDICAL PRESCRIPTIONS.

THE principal objects designed to be attained by the Composition of Medicines, are, to communicate an agreeable taste or flavour; to give a convenient form; to correct the operation of the principal medicine, or obviate some unpleasant symptom it is liable to produce; to promote its action, by the additional article exerting one of a similar kind; to obtain the joint operation of two remedies, having different powers; or to alter their usual effects, by the power which one may have of modifying the action of another.

A prescription has been usually divided into four parts, which compose it,—the *basis*, or principal article; the *adjuvans*, or that designed to promote the action of the former; the *corrigens*, or that which is intended to correct its operation, or obviate any unpleasant symptom which it may be apt to produce; and the *constituens*, or that which gives to the other ingredients consistence or form. These are not necessarily present in every formula; nor is the division of much importance, except as perhaps affording the best principle for regulating the order in which the ingredients of a prescription should be enumerated.

The following are the principal circumstances to be attended to in forming a prescription.

1st, Simplicity should be attained, as far as is consistent with the objects of the prescription. Nothing ought to enter into the composition which does not add to its virtue, render it less ungrateful, give it a convenient form, or which is not necessary to conceal any particular

ingredient; and, in general, the practice of accumulating a number of articles in one prescription is to be avoided.

2dly, Substances, it is evident, ought not to be mixed together, which are capable of entering into chemical combination, or of decomposing each other, unless it be with the view of obtaining the product of the combination, or decomposition, as a remedy.

3dly, Those mixtures are also to be avoided, in which one medicine, by its peculiar action on the stomach or general system, modifies and changes the action usually exerted by another, unless where the object is to obtain the effects of that modified operation.

4thly, The error of contra-indication is to be guarded against, or those medicines ought not to be combined, the virtues of which are not merely different, but are, in some measure, opposed to each other.

5thly, The ingredients which are to be mixed, must be such as will mix properly together, so that the form in which the remedy is designed to be exhibited, may be easily obtained and preserved.

Lastly, The form under which a medicine is prescribed, must be adapted to certain circumstances; principally to the nature of the disease, the nature of the remedy itself, and, as far as may be possible, to the taste of the patient.

The Doses of Medicines are not reducible to any general rules, from their general similarity of operation, or any other circumstance. The principal circumstances by which they are influenced are, Age, Sex, Temperament, Idiosyncrasy, Habit, and Disease.

Age.—From infancy to manhood, a larger dose of any medicine is requisite to produce its effect, in proportion to the advance in life. From manhood to old age, there is a similar gradation with regard to diminution of dose, though in a much less proportion than that which regulates the increase. The following table has been supposed to shew these proportions.

TABLE.

Let the dose for a person of middle age be . . .	1 or 1 drachm.
For one from xiv to xxi years, it will be . . .	$\frac{2}{3}$ or 2 scruples.
----- vii to xiv,	$\frac{1}{2}$ or half a dr.
----- iv to vii,	$\frac{1}{3}$ or 1 scruple.
----- of iv years of age,	$\frac{1}{4}$ or 15 grains.
----- iii -----	$\frac{1}{6}$ or half a scr.
----- ii -----	$\frac{1}{8}$ or 8 grains.
----- i -----	$\frac{1}{12}$ or 5 grains.

Sex.—Women, in general, require smaller doses of any medicine than men, a difference probably owing to their greater sensibility from their habits of life.

Temperament.—Those of the sanguine temperament are supposed to be more affected by medicines, and therefore to require smaller doses than those of the phlegmatic or melancholic; but in what has been said on this subject, there is so much uncertainty, that little reliance can be placed on it.

Idiosyncrasy.—This denotes that disposition in individuals to be affected by certain causes, in a manner different from the generality of mankind. Such idiosyncrasies are observed with regard to medicines, as well as to other agents; and, where they are known, require to be attended to by the prescriber.

Habit.—This has an important influence on the operation of medicines. In general, they lose some of their power by having been long continued. This is particularly the case with all strong stimulants and narcotics, and is even observed, to a certain extent, in some of the other classes of the materia medica. In a few instances, the reverse has been supposed to hold true.

Disease.—This has an influence on the doses of medicines not less important; the susceptibility to external impressions, and to action, being much varied in morbid affections, and the operations of remedies of course being modified by such variations. The state of susceptibility being in general apparent, when it varies much from the healthy standard, the doses of the medicines administered are easily regulated.

TABLES
OF
CHANGED NAMES.

TABLES

OF

CHANGED NAMES

IN

THE NEW EDINBURGH AND LONDON PHARMACOPŒIAS.

In drawing up these Tables, it has not been thought necessary to insert the names of the Simple Medicines, as both the proper names of the articles, according to the nomenclature of natural history, and their common or trivial names, are inserted in the index to the work; and thus the old or the new name of any simple substance may be easily found. In these tables, therefore, the names of the Compound Medicines only are inserted, and the catalogue of them has been extended so far as to include not only the synonyms inserted in the present editions of the London and Edinburgh Pharmacopœias, but a number of older names, once generally established, and still occasionally used.

TABLE I.	
OLD NAMES.	NAMES IN THE ED. PH.
Acetum vini	Acidum acetosum
Acidum vitriolicum	sulphuricum
vitrioli aromaticum	aromaticum
dilutum	dilutum
	NAMES IN THE LOND. PH.

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Ærugo æris	Sub-acetis cupri	Hydrargyrus cum sulphure
Æthiops mineralis	Sulphuretum hydrargyri nigrum	
Æther vitriolicus	Æther sulphuricus	
Aqua ammoniæ	Aqua carbonatis ammoniæ acetitis ammoniæ ammoniæ	Aqua ammoniæ puræ Spiritus cinnamomi
cinnaomoni spirituosa	Spiritus cinnamomi	Acidum nitrosum dilutum
cupri vitriolati composita fortis	Solutio sulphatis cupri composita Acidum nitrosum dilutum	Spiritus juniperi compositus
juniperi composita	Spiritus juniperi communis compositus	
lixivia caustica	Aqua potassæ	Aqua kali puri
menthæ piperitidis spirituosa	Spiritus menthæ piperitæ	Spiritus menthæ piperitidis sativæ
vulgaris spirituosa		
piperis Jamaicensis	Aqua myrti pimentæ	Aqua pimento
pulegii spirituosa		Spiritus pulegii
sappharina		Aqua cupri ammoniati
seminum anisi composita		Spiritus anisi compositus
styptica		
vitriolica camphorata	Solutio sulphatis cupri composita	Aqua zinci vitriolati cum camphora
Alkali fixum fossile	Soda	Natron
vegetabile	Potassa	Kali purum
volatile	Ammonia	Ammonia

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Alumen	Sulphas aluminæ	
ustum	exsiccatus	
Ammonia præparata	Carbonas ammoniæ	
Antimonium	Sulphuretum antimonii	
præparatum	præparatum	
calcareo-phosphoratum	Oxidum antimonii cum phosphate calcis	Pulvis antimonialis
muriatum	Murias antimonii	
tartarisatum	Tartaris antimonii	
vitrificatum	Oxidum antimonii cum sulphure vitrificatum	
Argentum nitratum	Nitras argenti	
Balsamum anodynum	Tinctura saponis cum opio	Linimentum saponis compositum
saponaceum	Tinctura saponis	Oleum sulphuratum
sulphuris	Oleum sulphuratum	Tinctura benzoës composita
traumaticum	Tinctura benzoës composita	Antimonium muriatum
Butyrum antimonii	Murias antimonii	
Calomelas	Sub-murias hydrargyri	Antimonium calcinatum
Calx antimonii nitrata	Potassa	Kali purum
Causticum commune acerrimum	Potassa cum calce	Calx cum kali puro
imitius		

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Causticum lunare	Nitras argenti	Argentum nitratum
Cerussa	Oxidum plumbi album	
Cerussa acetata	Acetis plumbi	
Cinnabaris factitia	Sulphuretum hydrargyri rubrum	Hydrargyrum sulphuratum rubrum
Coagulum aluminosum		Cataplasma aluminis
Confectio cardiaca	Electuarium aromaticum	Confectio aromatica
japonica	Electuarium catechu	
Crocus antimonii, vel crocus metallo-	Oxidum antimonii cum sulphure	
rum	per nitratem potassæ	
Cuprum ammoniacum	Ammoniacetum cupri	
vitriolatum	Sulphas cupri	
Decoctum album		Decoctum cornu cervi
chamaemeli, vel commune	Decoctum anthemidis nobilis	
Decoctum lignorum	guaiaci compositus	hordei compositum
pectorale		
Elatarium	Succus spissatus momordicæ elaterii	Electuarium sennæ
Electuarium lenitivum	Electuarium cassiæ sennæ	Confectio opiata
thebaicum	opiatum	Tinctura aloes composita
Elixir aloes		
guaiacinum	Tinctura guaiaci	opii camphorata
paregoricum	opii ammoniata	

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Elixir proprietatis	Tinctura aloes cum myrrha	Tinctura aloes composita
sacrum	aloes ætherea	
salutis	rhei cum aloë	
stomachicum	cassiae sennæ composita	sennæ
vitrioli acidum	gentianæ composita	gentianæ compositum
Emplastrum adhæsivum	Acidum sulphuricum aromaticum	Emplastrum lithargyri cum resina
Emplastrum attrahens	Emplastrum resinosum	cereæ compositum
cephalicum	simplex	pice burgundicæ compositum
cereum	simplex	cereæ compositum
commune	oxidi plumbi semivitrei	lithargyri
cum gummi	gummosum	lithargyri composit.
e cumino	oxidi plumbi semivitrei	cunini
lithargyri	ferri rubri	
compositum	ferri rubri	
roborans		thuris compositum
stomachicum		ladani
vesicatorium		cantharidis
Emulsio communis	meles vesicatorii	Lac amygdalæ
Extractum catharticum	Emulsio amygdalæ communis	Extractum colocynthidis compositum

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Extractum thebaicum		Opium purificatum
Ferri rubigo squamæ	Carbonas ferri præparatus Ferri oxidum nigrum	
Ferrum ammoniatum vitriolatum	Murias ammoniæ et ferri Sulphas ferri	Ferrum ammoniacale
Flores benzoini	Oxidum ferri rubrum	
martiales sulphuris zinci	Acidum benzoicum Murias ammoniæ et ferri	Flores benzoes Ferrum ammoniacale Sulphur sublimatum Zincum calcinatum
Fotus communis	Sulphur sublimatum Oxidum zinci	Decoctum pro fomento
Hepar sulphuris		Kali sulphuratum
Hiera picra	Sulphuretum potassæ	Pulvis aloes cum canella
Hydrargyrus acetatus	Acetis hydrargyri	Hydrargyrus muriatus
muriatus corrosivus mitis	Murias hydrargyri Sub-murias hydrargyri	Calomelas
præcipitatus nitratu8 ruber	Oxidum hydrargyri præcipitatus nigrum	Hydrargyrus muriatus mitis
præcipitatus cinereus sulphuratus niger	Oxidum hydrargyri cinereum Sulphuretum hydrargyri nigrum	Hydrargyrus cum sulphure

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Hydrargyrus vitriolatus flavus	Sub-sulphas hydrargyri flavus	Hydrargyrus vitriolatus
Infusum amarum rosarum sennæ communis	Infusum gentianæ luteæ compositum Infusum rosæ gallicæ	Infusum gentianæ compositum rosæ sennæ tartarisatum
Julepum e camphora e creta e moscho		Mistura camphorata cretacea moschata
Lac sulphuris Laudanum liquidum Linimentum album anodynum aquæ calcis opiatum saponaceum volatile	Tinctura opii Tinctura saponis cum opio Oleum lini cum calce Tinctura saponis cum opio Tinctura saponis Oleum ammoniatum Oxidum plumbi semivitreum Acetis potassæ Carbonas potassæ purissimus potassæ Tartris potassæ Sulphas potassæ	Sulphur præcipitatum Tinctura opii Unguentum spermatis ceti
Lithargyrus Lixiva acetata e tartaro purificata tartarisata vitriolata		Linimentum saponis cum opio Linimentum ammoniæ Kali acetatum præparatum <hr/> tartarisatum vitriolatum

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Lixiva vitriolata sulphure	Sulphas potassæ cum sulphure	Aqua kali puri
Lixivium causticum	Aqua potassæ	puri
saponarium		præparati
tartari		
Magnesia alba	Carbonas magnesiæ	
usta	Magnesia	
vitriolata	Sulphas magnesiæ	
Mel Ægyptiacum		Oxymel æruginis
rosaceum		Mel rosæ
Mercurius	Hydrargyrus	Hydrargyrus
calcinatus		calcinatus
corrosivus sublimatus	Murias hydrargyri	muriatus
ruber } præcipitatus ruber }	Oxidum hydrargyri rubrum per acidum nitricum	nitratu8 ruber
dulcis sublimatus	Sub-murias hydrargyri	Calomelas
emeticus flavus	Sub-sulphas hydrargyri	Hydrargyrus vitriolatus
præcipitatus albus	Oxidum plumbi rubrum	Calx hydrargyri alba
Minium		
Nitrum	Nitras potassæ	
Oleum tartari		Aqua kali præparati
Oxymel simplex		Mel acetatum.

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Philonium Londinense		Confectio opiata
Pilulæ cupri gunmosæ rufi thebaicæ	Pilulæ ammoniaretæ cupri aloes cum myrrha opiatæ	Pilulæ galbani composita aloes cum myrrha opii Mistura cretacea
Potio cretacea	Potio carbonatis calcis	
Pulvis antimonialis	Oxidum antimonii cum phosphate calcis	
Pulvis e bolo compositus cum opio e cerussa compositus cretaceus doveri sternutatorius stypticus		Pulvis cretæ compositus cum opio cerussæ Pulvis cretæ compositus ipecacuanhæ compositus asari compositus
Rob baccarum sambuci Rubigo ferri præparata	Carbonas ferri præparatus	Succus baccæ sambuci spissatus
Saccharum saturni Sal absinthii alkalinus fixus fossilis	Acetis plumbi Carbonas potassæ Carbonas sodæ	Cerussa acetata Kali præparata Natron præparatum

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Sal alkalinus fixus vegetabilis ammoniacus	Carbonas potassæ Murias ammoniæ	Kali præparatum
catharticus amarus	Carbonas ammoniæ Sulphas magnesiæ Sulphas sodæ	Ammonia præparata Magnesia vitriolata Natron vitriolatum
cornu cervi	Carbonas ammoniæ Acetis potassæ	Kali acetatum Natron vitriolatum
diureticus	Sulphas sodæ	
glauberi	Murias sodæ	
marinus	Sulphas ferri	Ferrum vitriolatum
martis	Sulphas potassæ cum sulphure	
polychrestus	Tartaris potassæ et sodæ	Natron tartarisatum
rupellensis	Carbonas potassæ	Kali præparatum
tartari	Carbonas sodæ	Natron præparatum
Soda purificata	Murias sodæ	
murata	Phosphas sodæ	
phosphorata	Tartaris potassæ et sodæ	Natron tartarisatum
tartarisata	Sulphas sodæ	Natron vitriolatum
vitriolata	Pulvis aromaticus	Pulvis aromaticus
Species aromaticæ	Æther sulphuricus cum alcohole	
Spiritus ætheris vitriolici ammoniæ	Alcohol ammoniatum	
aromaticus		Spiritus ammoniæ compositus
fœtidus	aromaticum fœtidum	fœtidus
cornu cervi	Aqua carbonatis ammoniæ	Liquor volatilis cornu cervi

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Spiritus mindereri	Aqua acetis ammoniæ	Aqua ammoniæ acetatæ
nitri dulcis	Spiritus ætheris nitrosi	Spiritus ætheris nitrosi
glauberi	Acidum nitrosum	Acidum nitrosum
salis ammoniaci	Aqua ammoniæ	Aqua ammoniæ
dulcis	Alcohol ammoniatum	Spiritus ammoniæ
marini glauberi	Acidum muriaticum	Acidum muriaticum
vinosus camphoratus	Tinctura camphoræ	Spiritus comphoratus
rectificatus	Alcohol	Alcohol
tenuior	Alcohol dilutum	
vitrioli dulcis	Æther sulphuricus cum alcohole	Spiritus ætheris vitriolici
volatilis aromaticus	Alcohol ammoniatum aromaticum	Spiritus ammoniæ compositus
fœtidus	fœtidum	fœtidus
Succi scorbutici	Succus cochleariæ officinalis compositus	Succus cochleariæ compositus
Sulphur antimonii præcipitatum } auratum antimonii }	Sulphuretum antimonii præcipitatum	
Syrupus balsamicus	Syrupus toluifæræ balsami	Syrupus toltanus
e meconio	papaveris somniferi	papaveris albi
Tabellæ cardiagæ		Trochisci cretæ
Tartarus crudus.	Super-tartaris potassæ impurus	
Tartari crystalli	Super-tartaris potassæ	
Tartarus emeticus	Tartaris antimonii	Antimonium tartarisatum
Tartarum solubile	Tartaris potassæ	Kali tartarigatum

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Tartarum vitriolatum	Sulphas potassæ	Kali vitriolatum
Tinctura aloes vitriolata	Tinctura aloes aetherea	Tinctura gentianae composita
amara	gentianæ composita	Tinctura cinnamomi composita
aromatica	lauri cinnamomi composita	cinchonae ammoniatae
corticis peruviani volatilis	muriatis ferri	ferri muriati
ferri	assafetidæ	assafetidæ
foetida	gualiaci ammoniata	gualiaci
gualiacina volatilis	mimosæ catechu	catechu
japonica	muriatis ferri	ferri muriati
martis	hellebori nigri	hellebori nigri
melampodii	rhei cum gentiana	
rhei amari	Infusum rosarum	Infusum rosae
rosarum	Vinum aloes socotornæ	Vinum aloes
sacra		Tinctura cardamomi composita
stomachica	Tinctura opii	opii
thebaica	toluiferae balsami	
tolutana		valerianae ammoniata
valerianæ volatilis	Trochisci gummosi	
Trochisci arabici		Trochisci amyli
bechici albi	Trochisci glycyrrhizæ	glycyrrhizæ
nigri	Sub-sulphas hydrargyri flavus	Hydrargyrus vitriolatus
Turpethum minerale		
Unguentum album	Unguentum oxidi plumbi albi	Unguentum cereæ

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Unguentum basilicum flavum cœruleum citrinum epispasticum fortius mitius e mercurio præcipitato saturninum simplex ad vesicatoria	Unguentum resinosum hydrargyri nitratis hydrargyri pulveris meloes vesicatorii infusi mel. vesicat. acetitis plumbi	Unguentum resinæ flavæ hydrargyri hydrargyri nitrati cantharidis Unguentum cantharidis calcis hydrargyri albi cerussæ acetatæ adipis suillæ cantharidis
Vinum amarum antimoniale chalybeatum Vitriolum album cœruleum viride Vitrum antimonii	Vinum gentianæ compositum tartritis antimonii Sulphas zinci cupri ferri Oxidum antimonii cum sulphure vitri- ficatum	Vinum antimonii ferri Zincum vitriolatum Cuprum vitriolatum Ferrum vitriolatum Antimonium vitrificatum
Zincum ustum vitriolatum	Oxidum zinci Sulphas zinci	Zincum calcinatum

TABLE II.

NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.	OLD NAMES.
Acetis hydragryri plumbi potassæ	Cerussa acetata Kali acetatum	Hydragryrus acetatus Saccharum saturni { Sal diureticus { Lixiva acetata Acetum vini Flores benzoini Aqua fortis Acidum vitriolicum { Acidum vitrioli aromaticum { Elixir vitrioli acidum Acidum vitrioli dilutum Æther vitriolicus Spiritus vinosus rectificatus Spiritus ammoniæ aromaticus fetidus
Acidum acetosum benzoicum nitrosum dilutum sulphuricum aromaticum	Flores benzoës Acidum nitrosum dilutum	
Æther sulphuricus Alcohol Alcohol ammoniatum aromaticum fetidum	Alcohol Spiritus ammoniæ compositus fetidus Ammonia	
Ammonia		Alkali volatile

NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.	OLD NAMES.
Ammoniæretum cupri	Aqua ammoniæ acetatæ puræ	Cuprum ammoniacum
Aqua acetis ammoniæ	Liquor volatilis cornu cervi	Spiritus minderevi
carbonatis ammoniæ	Aqua pimento kali puri	Aqua ammoniæ causticæ
myrti pimentæ potassæ	Ammonia præparata	{ Spiritus cornu cervi
Carbonas ammoniæ	Creta alba	{ Aqua ammoniæ piperis Jamaicensis
		{ lixivium causticum
		{ Lixivium causticum
		{ Sal ammoniacus volatilis
		{ cornu cervi
		{ Creta alba
		{ Lapilli cancrorum
		{ Rubigo ferri præparata
		{ Magnesia alba
		{ Sal alkalinus fixus vegetabilis
		{ tartari
		{ Lixiva e tartaro
		{ Sal alkalinus fixus fossilis
		{ Soda purificata
		{ Lapis calaminaris
Decoctum anthemidis nobilibus guaiaci compositus		Decoctum chamaemeli, vel commune lignorum

NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.	OLD NAMES.
Electuarium aromaticum cassiæ sennæ catechu opiatum	Confectio aromatica Electuarium sennæ	Confectio cardiaca Electuarium lenitivum Confectio japonica
Emplastrum meloes vesicatorii oxidi ferri rubri plumbi semivitrei	Confectio opiata Emplastrum cantharidis	Electuarium thebaicum Emplastrum vesicatorium roborans
resinosum simplex	lithargyri	{ Emplastrum commune lithargyri
Emulsio amygdalæ communis	lithargyri cum resina ceræ compositum	Emplastrum adhaesivum cereum
Murias ammoniæ et ferri	Lac amygdalæ	Emulsio communis
antimonii hydrargyri sodæ	Ferrum ammoniacale Antimonium muriatum Hydrargyrus muriatus	Sal ammoniacus { Ferrum ammoniatum Flores martiales Butyrum antimonii Hydrargyrus muriatus corrosivus { Soda muriata Sal marinus
Nitras argenti potassæ	Argentum nitratum	Causticum lunare Nitrum
Oleum ammoniatum	Linimentum ammoniæ	Linimentum volatile

NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.	OLD NAMES.
Oleum lini cum calce sulphuratum	Oleum sulphuratum	Linimentum aquæ calcis
Oxidum antimonii cum phosphate calcis	Pulvis antimonialis	Balsamum sulphuris
Oxidum antimonii cum sulphure per nitratem potassæ		Antimonium calcareo-phosphoratum
Oxidum antimonii cum sulphure vitrificatum	Antimonium vitrificatum	Crocus antimonii, vel crocus metallicum
Oxidum ferri nigrum rubrum		Vitrum antimonii
hydrargyri per acidum nitricum		Ferri squamæ
hydrargyri cinereum		Ferrum vitriolatum ustum
plumbi album rubrum		Hydrargyrum nitratus ruber
semivitreum		
zinci		præcipitatus cinereus
impurum		
Phosphas sodæ Potassæ		
cum calce		
	Zincum calcinatum	Cerussa
		Minium
		Lithargyrus
		{ Zincum ustum
		{ Flores zinci
		Tutia
	Kali purum	Soda phosphorata
		{ Alkali-fixum vegetabile
		{ Causticum commune acerrimum
	Calx cum kali puræ	Causticum commune mitius

NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.	OLD NAMES.
Potio carbonatis calcis	Mistura cretacea	Potio cretacea
Pulvis carbonatis calcis compositus	Pulvis cretæ compositus	Pulvis cretaceus
Soda	Natron	Alkali fixum fossile
Solutio sulphatis cupri composita		Aqua styptica
Spiritus ætheris nitrosi	Spiritus ætheris nitrosi	Spiritus nitri dulcis
cinnamomi	cinnamomi	Aqua cinnamomi spirituosus
Sub-acetis cupri		Ærugo æris
Sub-murias hydrargyri	Calomelas	{ Calomelas
∞ Sub-sulphas hydrargyri flavus	Hydrargyrus vitriolatus	{ Hydrargyrus muriatus mitis
— Succus spissatus momordicæ elaterii		Turpethum minerale
— Succus cochleariæ officinalis composi-	Succus cochleariæ compositus	Elaterium
situs		Succi scorbutici
Sulphas aluminæ		Alumen
cupri	Cuprum vitriolatum	Vitriolum cœruleum
ferri	Ferrum vitriolatum	{ Sal martis
magnesiæ	Magnesia vitriolata	{ Vitriolum viride
potassæ	Kali vitriolatum	Sal catharticus amarus
		{ Tartarum vitriolatum
		{ Lixiva vitriolata
		Sal polychrestus
potassæ cum sulphure		{ Soda vitriolata
sodæ	Natron vitriolatum	{ Sal glauberi

NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.	OLD NAMES.
Sulphas zinci	Zincum vitriolatum	Vitriolum album
Sulphur sublimatum	Sulphur sublimatum	Flores sulphuris
Sulphuretum antimonii		Antimonium
antimonii præcipitatum		{ Sulphur antimonii præcipitatumæ
		{ auratum antimonii
hydrargyri nigrum	Hydrargyrus cum sulphure	Æthiops mineralis
rubrum	Hydrargyrum sulphuratum rubrum	Cinnabaris factitia
potassæ	Kali sulphuratum	Hepar sulphuris
Syrupus toluiferæ balsami	Syrupus toluanus	Syrupus balsamicus
Super-tartris potassæ		Tartari crystalli
Tartris antimonii	Antimonium tartarisatum	Tartarus emeticus
potassæ	Kali tartarisatum	{ Tartarum solubile
		{ Lixiva tartarisata
potassæ et sodæ	Natron tartarisatum	{ Soda tartarisata
		{ Sal rupellensis
Tinctura benzoës composita	Tinctura benzoës composita	Balsamum traumaticum
camphoræ	Spiritus camphoratus	Spiritus vinosus camphoratus
mimosæ catechu	Tinctura catechu	Tinctura japonica
muriatis ferri	ferri muriati	{ ferri
		{ martis
opii ammoniata	opii camphorata	Elixir paregoricum

NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.	OLD NAMES.
Tinctura saponis saponis cum opio toluiferæ balsami	Linimentum saponis cum opio	Linimentum saponaceum opiatum anodynum Tinctura tolutana
Unguentum acetitis plumbi nitratiss hydrargyri oxidi plumbi albi pulveris meloes vesicatori resinosum	Unguentum cerussæ acetatæ Ceratum cantharidis Unguentum resinæ flavæ	Unguentum album citrinum saturninum epispasticum fortius basilicum flavum
Vinum tartritis antimonii	Vinum antimonii	Vinum antimoniale



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